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THE ROOT-STRUCTURE OF SPIGELIA MARILANDICA L., PHLOX OVATA L. AND RUELLIA CILIOSA PURSH.

BY THEO. HOLM.

(With five figures drawn by the author.)

In the very comprehensive work of Dr. Solereder,¹ dealing with the anatomy of dicotyledonous plants, the *Polemoniaceæ* are characterized as lacking crystals, with the only exception of *Phlox Carolina*. But in this plant, better known as *Phlox ovata* L., Dr. Solereder states that Professor Henry Greenish² has found large, fusiform cystolithes in the cortical parenchyma of the roots.

Having for several years been engaged in studying the anatomy of our native plants, the writer has always been desirous of comparing the anatomical characters of the various families. While examining the structure of the *Acanthaceæ* that occur in the vicinity of Washington, I noticed a very peculiar structure, especially in the roots, which led me to undertake a more detailed investigation of certain tissues with their cell-contents, and quite especially the cystolithes. Being well acquainted with Professor Greenish's original paper and his carefully executed figures of the cystolithes, which he thought to have detected in *Phlox ovata*, I extended my investigation to some members of this family, including this particular species. However, I failed to observe any crystals or cystolithes, and inasmuch as Professor Greenish was not so absolutely certain that the roots and rhizomes, which he had before him, really belonged to some *Phlox*, I commenced to doubt the correctness of the statement that the roots of *Phlox ovata* contain cystolithes. It

¹ Systematische Anatomie der Dicotyledonen. Stuttgart, 1899, p. 622.

² The Pharmaceutical Journal and Transactions. London, 1891, p. 839.

would, indeed, be very strange if a single species of a family that contains about 150 species, should possess such marked characteristics unknown from any of the others.¹

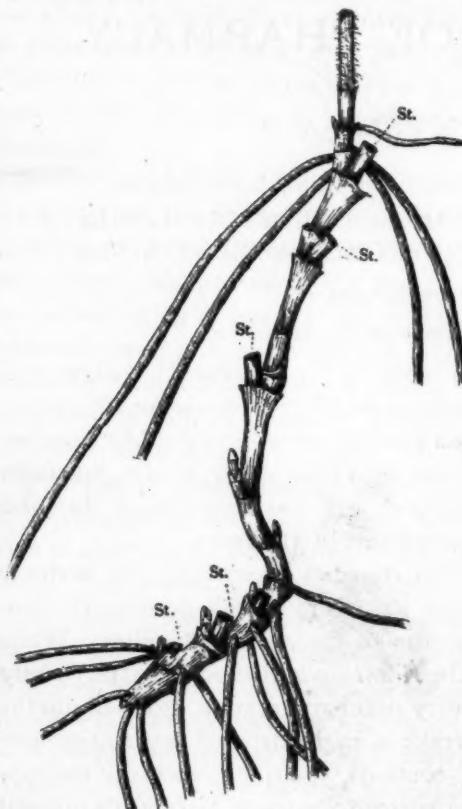


FIG. 1.

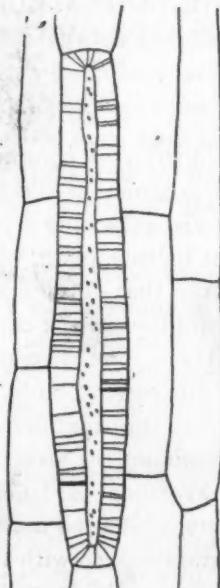


FIG. 2.

Fig. 1. *Ruellia ciliosa*, Pursh. The rhizome of an old specimen showing the basal portions of the aerial shoots still attached (St.). This rhizome shows several stretched internodes and some very short ones at the base, both forms often occurring at the same time in this species; natural size.

Fig. 2. Longitudinal section of the same root, showing a stone-cell. $\times 480$.

From this point of view the writer wishes to present a few data about the root-structure of *Phlox ovata*, and to demonstrate that

¹ After this paper had been written I happened to see an article about the same subject by Mr. W. W. Stockberger in *Proc. Am. Pharm. Assoc.*, 1905, p. 324, who has reached the same conclusion.

the plant described by Professor Greenish was no doubt a species of *Ruellia*, and probably *R. ciliosa*, Pursh.

The specimens examined by Professor Greenish were "a broker's sample of *Spigelia* root," and "a bold sample!" They differed from true *Spigelia* in their "straighter, thicker and less wiry rootlets and smoother rhizome, from which the cup-shaped scars that characterize *Spigelia* were absent, the lower portions of the aerial stems frequently remaining still attached." These characters led Professor Greenish to believe that he was dealing with *Phlox Carolina*, the root of which has been substituted for that of *Spigelia Marilandica* in the United States. Now in regard to the identification of these supposed *Spigelia* rhizomes, Professor Greenish compared them with

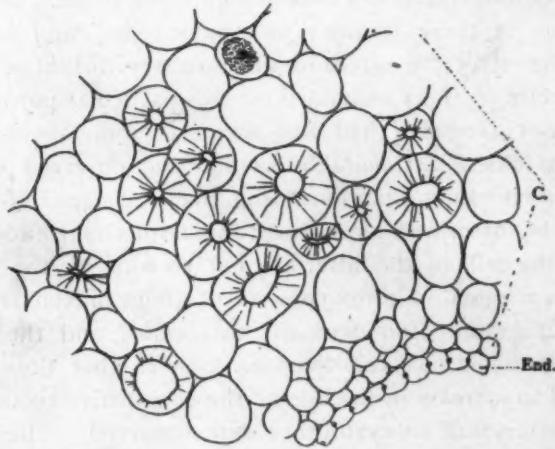


Fig. 3. Same species. Transverse section of a secondary root. C = the cortical parenchyma with one cystolithe and several stone-cells with narrow lumen and heavily thickened, porous walls; End. = endodermis with the Casparyan spots. $\times 480$.

herbarium-specimens of the *Phlox*, which were unfortunately mostly without roots. There is no statement to the effect that Professor Greenish examined the root-structure of the true *Phlox*, which, as stated above, was merely represented by rather defective herbarium-specimens.

The anatomical structure of the supposed *Phlox* roots is described and illustrated by Professor Greenish, who calls attention to the "numerous stone-cells and cystolithes," and it is on account of this diagnosis that *Phlox Carolina* has been mentioned by Dr. Solereider

as an exception, in regard to the occurrence of cystolithes, from all the other members of the *Polemoniaceæ*.

However, the roots of true *Phlox ovata* show the structure as follows: There are many root-hairs, and inside epidermis is an exodermis, a single layer of pentagonal cells (when viewed in transverse section), which are thin-walled and about as large as the adjoining cells of the cortical parenchyma. The cortex consists of about twelve layers, of which the peripheral two or three are slightly thick-walled, the others are thin-walled and constitute quite a compact tissue, the intercellular spaces being narrow.

A thin-walled endodermis surrounds the continuous pericambium, inside of which are many groups of leptome and rays of vessels with strata of moderately thickened conjunctive tissue. No crystals occur in any of these tissues: no "stone-cells" and no "cystolithes." The structure agrees in all respects with that of the roots of other species of *Phlox* examined for this particular purpose.

If Professor Greenish had had access to some more complete specimens of true *Phlox ovata*, he would have observed that their root structure does not differ much from that of *Spigelia Marilandica*, which may be described as follows: Epidermis and exoderminis as above, but the cells of the latter are not so wide as the adjoining cortical parenchyma. Cortex consists of about fifteen thin-walled and compact strata. Endodermis is thin-walled, and the pericambium shows numerous cell-divisions, besides that the stele has commenced to increase in thickness; the conjunctive tissue is thick-walled. No crystals or cystolithes were observed. The structure is, thus, almost identical with that of true *Phlox ovata*. While thus the roots of *Phlox* and *Spigelia* look very much like each other, the rhizomes are very distinct, and no species of *Phlox* possesses a rhizome that in any way can be compared with that of *Spigelia*: with the "cup-shaped scars" from the dead stems and the somewhat matted roots, developed from the "very short internodes of the rhizome."

It was, therefore, no difficult matter to decide that the plant described by Professor Greenish was no *Phlox* and of course no *Spigelia* either. But what was it? As mentioned above, the writer had commenced a study of the *Acanthaceæ*, and it so happened that one of these, *Ruellia ciliosa*, showed a root-structure so characteristic that I feel confident that this is the plant which was confounded with *Phlox Carolina* and sold as a substitute for *Spigelia* in accordance with Professor Greenish.

The root-structure of *Ruellia*, when examined under the microscope, is widely different from that of *Spigelia*, but the rhizome, at least its external structure, resembles that of *Spigelia* much more than any species of *Phlox*; to the non-critical examiner the rhizomes of *Ruellia* may easily be taken for true *Spigelia*. In order to guard against any such mistake the following points may be recorded.

Fig. 1 represents a mature rhizome of *Ruellia ciliosa*, Pursh, more than seven years old. The lower portion of this rhizome shows a more condensed growth and shorter internodes than the upper part, which is almost vertical and of which the internodes are stretched.

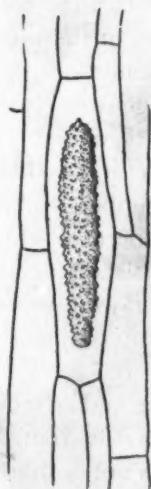


FIG. 4.

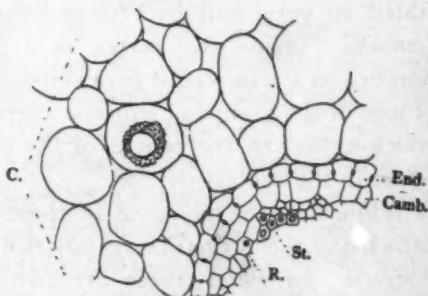


FIG. 5.

Fig. 4. Longitudinal section of the same root, showing a cystolith. $\times 480$.

Fig. 5. Transverse section of another root, but of the same species, showing the cortex (C.) with a cystolith, the endodermis (End.), the pericambium (Camb.) and the leptome with a cell containing a raphidine (R.) and some stereomeric cells (St.). $\times 480$.

Such difference in growth is commonly to be observed in *Ruellia*. The basal part of the aerial shoots remain attached, as may be seen from the figure, thus the cup-shaped scars so characteristic of *Spigelia* are absent. The roots are long, sparingly branched, and generally coarser than those of *Spigelia*. If we now examine the internal structure of the *Ruellia* rhizome, we notice at once the abundance of cystolithes in the cortex and pith, while these are totally absent from the rhizome of *Spigelia*.

In cases where the rhizome of *Ruellia* may be less represented, the roots alone are sufficient to prove that they belong to this genus and not to *Spigelia*. The most conspicuous and reliable features by which the roots of *Ruellia* may be characterized consist in as follows: The hairy epidermis and thin-walled exodermis surround the cortical parenchyma, which consists of about twelve layers of cells, thick-walled in the two peripherals, but thin-walled in the others. In this parenchyma, the cortical, we notice (in transverse sections, *Fig. 3*) a number of thick-walled cells with the walls porous and the lumen quite narrow; our *Fig. 2* shows one of these "stone-cells" in longitudinal section, surrounded by thin-walled cortical cells. And in this same parenchyma, the cortex, we notice, furthermore, the presence of numerous cystolithes with distinct granulose surface (*Fig. 4*, longitudinal section); viewed in cross-sections the cystolithes (*Fig. 5*) are seen to be hollow, but quite thick-walled. In other words, we have before us exactly the same structure as illustrated so very well by Professor Greenish of his supposed *Phlox Carolina*. Inside the cortex is a thin-walled endodermis, which borders on a thin-walled pericambium. The stele consists generally of four broad groups of leptome alternating with four rays of vessels which extend to the centre of the root, there being no conjunctive tissue in the central portion.

While thus the presence of these large cystolithes and sclerotic cells make the structure readily distinguishable from the roots of *Spigelia* and *Phlox*, there are two other characters noticeable in *Ruellia*, which are equally striking: The presence of stereids in the leptome (*Fig. 5*) and of raphidines also in the leptome. Of these the former are thick-walled, prosenchymatic cells, while the latter, first detected by Russow,¹ remind very much of raphides, and are known only from the *Acanthaceæ*. The raphidines may be single or many together in one cell of the leptome, but they are often difficult to find on account of their diminutive size. The cystolithes, on the other hand, can hardly escape the attention, and these are very characteristic of the family *Acanthaceæ*, occurring in the vegetative organs of these: the stem, the leaf and the root. But they are also known from a few other families, for instance: *Cucurbitaceæ*, *Boraginaceæ* and *Urticaceæ*, none of which, however, may be mistaken for

¹Sitzungsber. Naturforsch. Gesellsch. Dorpat., Vol. V, 1881, p. 308.

Spigelia, as far as we know the *Spigelia* root and rhizome of the Pharmacopœia.

While thus the roots of *Spigelia* may be readily distinguished from those of *Ruellia*, I intend to illustrate the anatomical structure of the parts above ground of these plants, in a subsequent paper, in order to make the distinction as plain as possible.

Brookland, D. C., October, 1906.

UNITED STATES ARMY LABORATORY.¹

BY C. LEWIS DIEHL.

When I graduated in the Philadelphia College of Pharmacy in 1862, it was my earnest wish that I might have the opportunity to engage in the practical production of pharmaceuticals and chemicals on a manufacturing scale. This opportunity came to me during the late spring of that year, when I received a position with John Wyeth & Brother, who were then engaged in filling large contracts to supply the Army with drugs and medicines, and assigned to me the charge of their laboratory about to be opened for the manufacture of such pharmaceutical preparations as could be profitably made by them. Comfortably and satisfactorily situated, in a position in every way comporting with my ambition, I was rudely awakened from such dreams as are possible only to youth, by the reverses to our Army, by the invasion of Maryland, by the disaster at Antietam ; and, though loath to relinquish a position in every way desirable, I enlisted in the 15th Pennsylvania—the so-called Anderson—Cavalry in fulfilment of a duty which had been delayed only by reason of the obligation to serve the full term of my apprenticeship and the desire to complete my courses in the College of Pharmacy.

Returning convalescent, after having been wounded at Murfreesboro and discharged from the Army, I naturally applied for a re-engagement by the Messrs. Wyeth, but found at the time no opening, the management of the laboratory having been entrusted to satisfactory hands. It was intimated to me, however, that there might be

¹ This article was prepared at the request of Mr. M. I. Wilbert and presented to the historical section of the American Pharmaceutical Association in 1905.

an opening for me in the Army Laboratory that was about to be established in Philadelphia, and, thanks to the Messrs. Wyeth and to Prof. John M. Maisch, whose acquaintance I had made under favorable auspices, I succeeded in obtaining the appointment of *Assistant Chemist* under Professor Maisch.

More than forty years have elapsed since I entered upon my duties in the United States Army Laboratory at the N. E. corner Sixth and Oxford Streets, Philadelphia (during April, 1863), and I depend altogether on memory, with the slender reminder of several photographic interiors, for what I am about to say. The grounds on which the laboratory was situated occupied a parallelogram of, I should say, about 150 to 175 feet. The main building, three stories high, with a well-lighted basement throughout, faced west on Sixth Street, flush with the pavement, about 100 feet long and joining a one-story building on Oxford Street, facing south, about 60 or possibly 75 feet long, and perhaps 60 feet in depth, while on Sixth Street, or the main front, it was separated by a gateway from another one-storied structure, extending eastward about 85 to 100 feet and constituting the northern boundary of the grounds. The remaining portions of the northern and southern boundaries were enclosed by a wooden fence, as was also the rear, or eastern boundary, when the laboratory was first opened, but in time was occupied by a frame structure, running the entire length, and used for the washing and storage of bottles, the carpenter-shop and other similar purposes. The only entrance into the laboratory from the street was an ordinary doorway, immediately adjacent to the gateway mentioned, which was for the exclusive use of teams. The doorway opened into a short, rather narrow passage, to the left of which was a small office, and immediately adjoining this the private office of the Superintendent, Surgeon A. K. Smith, and of the Chief Chemist, Professor Maisch, who, however, used it chiefly as an experimental laboratory. Through the short passage mentioned, leading into the packing room, the employees had to pass on their way to and from their work, and consequently under surveillance from the office—those employed on the upper floor of the main building reaching their stations by a single (and only) stairway along the east wall of the packing-rooms—the latter occupying about one-half the space of the first floor, minus the space occupied by the offices and hallway. The remaining half of the first floor—composing the

southwest corner of the main building—was the mill-room, where the drugs used were ground and pulverized for further treatment or final disposition; this important department being provided with numerous mills, sieves, etc., of suitable variety, size and construction to meet the requirement of the time. Immediately adjacent to this mill-room, in the one-story structure on the Oxford Street (south) side of the building complex, was the laboratory for operations requiring the application of steam, the entire structure being occupied by this, with the exception of a space in the northeast corner in which the engine and boilers supplying the necessary steam were enclosed—a space over the boilers being so constructed as to form a drying-room, which was conveniently reached by a door from the mill-room.

The steam laboratory which was reached from the mill-room by a descent of three or four steps, and from the yard on a level through a door in the northern part, was a lofty apartment, possibly 18 feet high, and 60 by 60 feet in area, with open transoms for ventilation and with windows on the northern (yard) and southern (Oxford Street) fronts for light as well as ventilation. This department was under the charge of Mr. Henry W. Scheffer, now of the well-known St. Louis firm of Larkin & Scheffer, and was devoted to the various operations of solution, percolation, distillation, and other operations necessary in the manufacture of solid and fluid extracts, of morphine and strychnine, and the preparation, crystallization, or granulation of certain salts, such as acetate of zinc, Rochelle salts, alum, lead acetate, ammonium muriate, copper sulphate, etc., etc.

In the yard, in close proximity to the northeast corner of this steam laboratory, was a small but lofty one-story structure, enclosing the ether, chloroform, and nitrous-ether stills, the condensing apparatus being situated on a platform composing a sort of second floor, from which the condensed ethers were conducted into receptacles within convenient reach of the operator at the stills. Needless to say that the source of heat in this isolated building was steam from the boilers, and that flame of any description was strictly tabooed.

During the first period of my connection with the laboratory, this, the so-called ether room or department, was under my charge, in connection with my specific duties, the operations requiring the application of direct heat; but later on this department was given in charge of Mr. John (?) Pearce, a graduate of Yale College (or

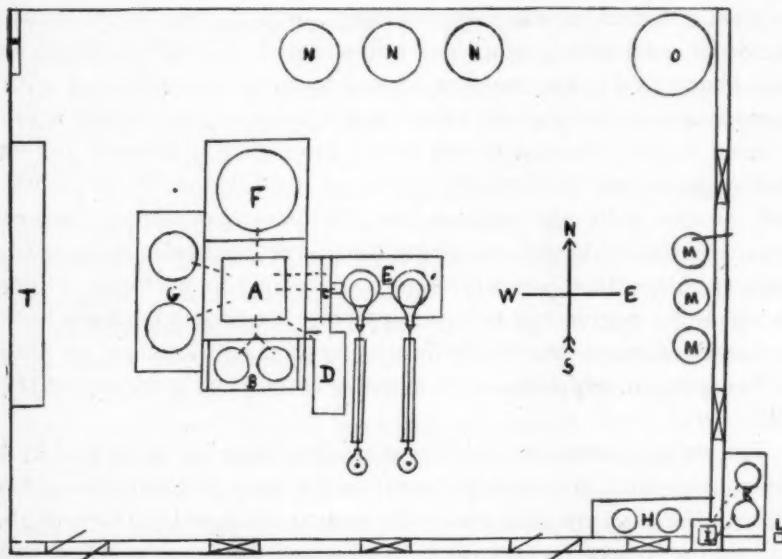


FIG. 1.—Diagram of Furnace Room. Flat Inspection.

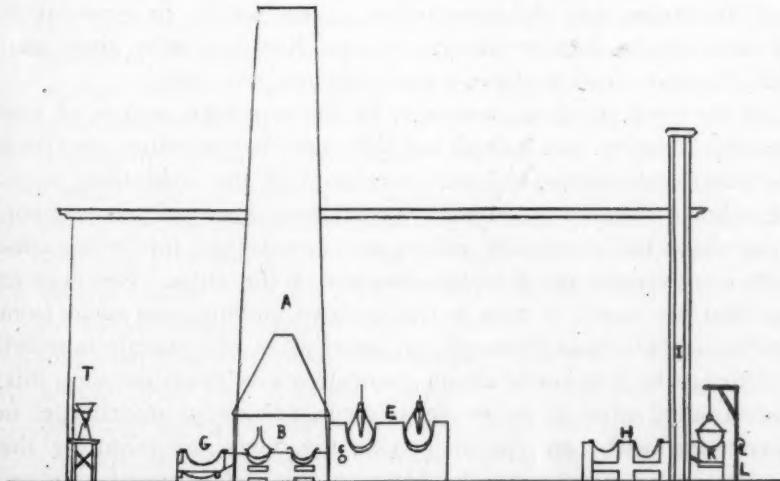


FIG. 2.—Diagram of Furnace Room. Elevation.

was it Harvard?) and an accomplished chemist, who had been my assistant. It would doubtless be interesting to give a description of the manufacture of ether, chloroform, etc., and the apparatus employed, but these were essentially the same as those then practiced and in use in the laboratory of Dr. E. R. Squibb, and probably still in use, and have, I believe, been sufficiently described heretofore. I shall therefore confine myself to a description of the operations in the so-called furnace room, which practically composed the sum total of my experience in the U.S.A. Laboratory.

THE FURNACE ROOM.

This was situated in the one-story structure initially mentioned as constituting the northern boundary of the laboratory site, extending eastward from Sixth Street for a distance of possibly 85 or 100 feet, and occupied about 50 feet of the extreme eastern side of this structure. I have prepared two sketches (*Fig. 1* and *2*), the one showing the arrangement of this room, and the various furnaces in flat perspective, the other in elevation, which may serve to elucidate my description of the various operations.

Around a central stack (*A*)—not however, central in its position towards the encircling walls—four sets of furnaces were grouped as shown, the purpose of which will be explained as we reach the operations for which they were constructed. A smaller stack (*I*), situated in the southeast corner of the room, admitted the flues from a set of furnaces on the interior, and also from another set on the exterior of the building. Along the eastern wall there were several solid leaden tanks (*m, m, m,*) for sulphuric acid mixtures, while large wooden tanks (*n, n, n,*), of various capacities, were ranged along the blank northern wall of the room. The general work table (*T*), for small operations requiring gas as fuel, for filtrations, etc., was placed against the blank western wall—a wardrobe (*W*), fitting a space in the corner, while along the front (southern) wall, between the two doors, were the sinks, water supply, and various vessels, such as earthen-ware crocks, etc.—for such use as might be. The room was lofty, well-lighted, paved with brick, but, so far as I can now recall, was not provided with facilities for ventilation other than the doors and windows.

Before giving in brevity a description of the uses to which the different furnaces and appliances were put, I should mention that

during my incumbency I had as principal assistant, Harry Grant, a very respectable and gentlemanly young fellow, who, though classed as a laborer, performed his duties intelligently and proved very valuable ; other assistants, ordinary laborers, were put into requisition as exigency demanded.

Beginning then at the hooded furnace (*B*) shown in the half-tone picture (*Fig. 3*), this served the purpose of a fume chamber, and was, as this designation implies, used for operations during which noxious fumes were disengaged. The furnace openings were closed

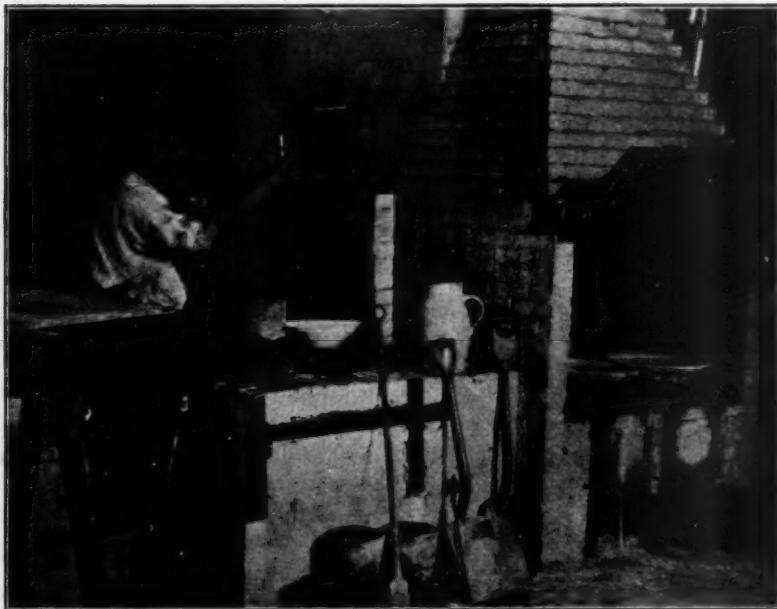


FIG. 3.—Hooded Furnace.

with shallow sand baths for the reception of porcelain dishes or other vessels required for the operation in hand. Thus, on one of them (in *Fig. 2*) is shown a porcelain capsule with an inverted funnel which was used for the manufacture of

Phosphoric Acid from phosphorus by oxidation with concentrated nitric acid. The latter having been placed into the capsule in sufficient quantity, a large funnel was inverted into the capsule, of such dimension that its edges just dipped into the acid. From time to time sticks of phosphorus were introduced, which were rapidly

attacked, with abundant evolution of nitrous vapors and finally dissolved and converted into phosphoric acid. When sufficient phosphorus had been converted in this way, the excess of nitric acid was driven off, the acid diluted, tested for arsenic, if necessary freed from it, and then diluted to the proper strength. Large quantities of diluted phosphoric acid were thus made. Or the capsule was used for the preparation of

Mercuric Nitrate, by the direct action of nitric acid upon metallic mercury. The very handsome pale yellow mass of crystals obtained was then heated until the salt was perfectly dry and more or less powdery, and the heat being increased carefully, it was finally converted into

Mercuric Oxide, which was obtained in this way in form of beautiful bright-red minute crystals, very superior in appearance to the oxide as ordinarily supplied.

Silver Nitrate was another salt that was made in this furnace in large quantities, and almost continually for long periods. The silver for this purpose was supplied by the U. S. Mint, and was 99.5 per cent. pure, the 0.5 per cent. being copper. Small as this percentage was, in working up a hundred ounces of the metal—the usual quantity—considerable copper nitrate accumulated in the mother liquid, so that only the first crop of crystals, after washing with a little ice cold distilled water, could be utilized without re-crystallization. The remainder, amounting to one-third or even less of the entire quantity, had to be re-crystallized. Finally, the mother liquor was evaporated to dryness, carefully powdered and heated until it became of a uniform blackish-brown color; then cooled, dissolved in distilled water, and the clear, now colorless filtrate, boiled with nitric acid to decompose the nitrite into which the silver salt had been partially converted, and the silver nitrate was then crystallized as before, or, more frequently, was converted into

Fused Silver Nitrate, in the form of small cones; in fact, most of the silver nitrate was so converted; this operation being performed on the general work table (*T*) over a gas flame. The silver nitrate was placed into a porcelain casserole with cover, carefully heated to fusion, and then as carefully poured into the moulds of silver—an operation which insured black fingers, and black stains on the face and wearing apparel of the operator notwithstanding all conceivable precaution to avoid them. Personally I have never

succeeded in avoiding silver-nitrate stains when working with that commodity, and I know of no one that has. Another salt that was made on this furnace in large quantities was

Mercuric Sulphate—this, of course, by the direct action of sulphuric acid on metallic mercury. The beautiful white salt produced was used exclusively for making

Corrosive Sublimate. The perfectly dry salt was intimately mixed with chlorid of sodium in molecular quantities and by means of an

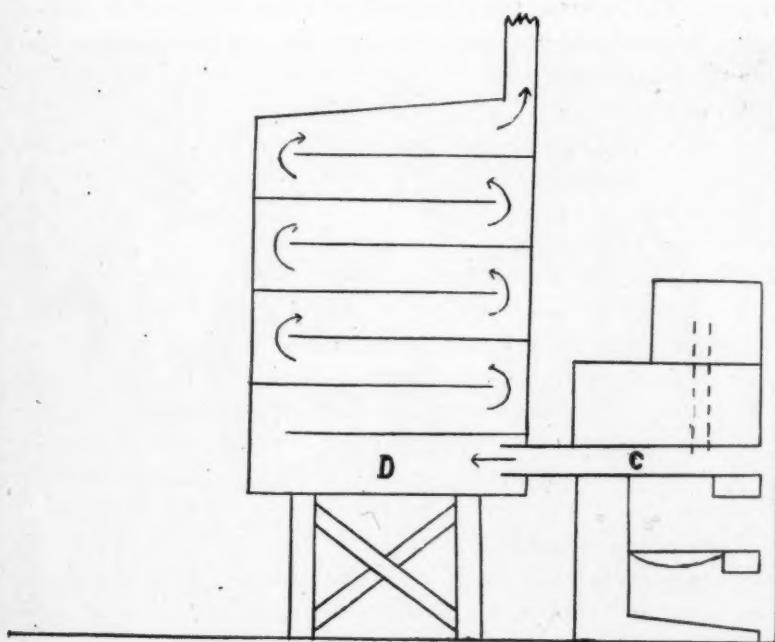


FIG. 4.—Diagram of Corrosive Sublimate Apparatus.

iron spoon conveyed in small portions at the time into the subliming or vaporizing tube (*C*) previously and continuously heated at a proper temperature by the fire beneath. Here the interchange of elementary constituents took place, mercuric chloride vapor passed into the condensing chamber (*D*), where it had to traverse a series of shelves with openings at alternate ends in the direction of the arrows (shown in detail by *Fig. 4*), and was so perfectly condensed, in the form of fine powder, during its passage towards the flue, that it was practically all deposited on the shelves without appreciable

loss. From time to time the sodium sulphate accumulating in the subliming tube was scraped out with the feeding spoon. The novel idea of carrying the sublimate vapor into a chamber and condensing it in fine powder form, instead of subliming it in crystalline masses, as is and has been the practice of manufacturers, was conceived by Professor Maisch in consequence of the demand of the Medical Purveyor for large quantities of powdered corrosive sublimate and the danger incurred by the operator during the ordinary process of reducing the crystalline salt to powder. The one doubt that presented itself to our minds was the failure of a sufficient draught to prevent the

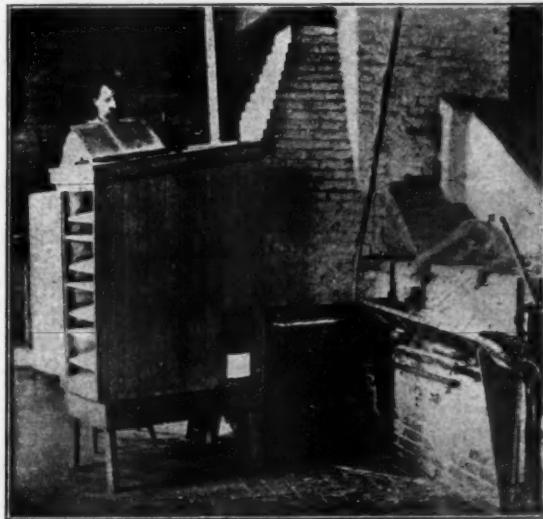


FIG. 5.—Subliming Chamber for Corrosive Sublimate.

leakage of the vapor through the joints formed by the sliding doors of the chamber, well shown in the half-tone picture (*Fig. 5*), on the one hand, or the possible loss by excess of draught, which might carry much of the mercurial vapor into the chimney, on the other. But both of these points were definitely and favorably settled after the first few trials. The draught being inward, no corrosive sublimate vapor escaped into the laboratory; and the distance traversed by the vapor insured its practically complete condensation before it reached the exit into the flue. It is safe to say, that this idea has given the incentive to other applications of a principle which had previous to this time been applied probably only to the sublimation

of sulphur—for example, to the vaporization of camphor into large chambers and its condensation in powdery form by partitions forcing its passage in alternate directions.

Next to the corrosive sublimate tube and furnace were two deep sand baths for the reception of large ($6\frac{1}{2}$ to 7 gallons) tubulated glass retorts (E) which were almost continuously in use for the distillation of

Heavy Oil of Wine (Oleum Aethereum). This arrangement is shown in detail by Fig. 6 and requires little explanation. The retorts were of such size as to leave but a small space for sand between them and the interior sides of the sand bath, the thin-walled iron sand bath being so fitted into the furnace walls that the flues

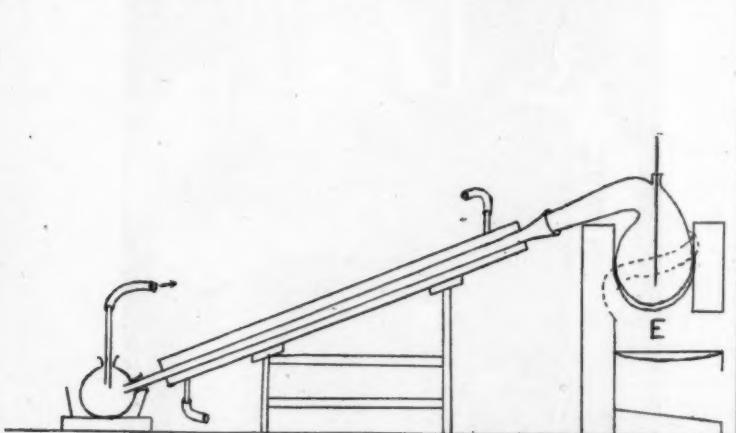


FIG. 6.—Apparatus for Distilling Heavy Oil of Wine.

from the fire bed made a complete spiral circuit before entering the stack. This had for the purpose the expeditious control of the heat, the closing of the draught door and opening of the fire door admitting cold air through the latter, thus quickly lowering the temperature, while the closing of the fire door and the opening of the draught door caused an equally rapid increase of the temperature—the fuel in this, as in all other furnace operations, being anthracite coal. The necessity of this control was due to the fact that the successful production of heavy oil of wine depends on maintaining the right temperature, which lies within narrow limits. If below 150° C. (302° F.) the reaction slackens and fails almost completely in producing heavy oil of wine, other undesirable products

being formed instead; on the other hand, if it rises above 160° C. (320° F.) the contents of the retort are not only liable, but will almost inevitably froth over, and the material becomes an absolute loss. The best results were obtained if the temperature did not vary much, one way or the other, from 155.5° C. (312° F.) The distillation of heavy oil of wine being a practically daily task, at least for a long period, the first duty in the morning, and the last in the evening, was connected with it. The retorts, if not cleaned the evening before, for which frequently there was no time, were emptied and carefully cleaned, so as not to leave as much as a speck of the carbonaceous product of decomposition, which sometimes encrusts parts of the inner walls, in them; for it was found that the presence of such was very likely to cause the frothing over of the contents during the distillation. Having then been thoroughly rinsed and drained, and dried on the outside, they were placed on a thin layer of sand in the sand bath, and filled through the tubulure with the previously prepared mixture of strong alcohol and concentrated sulphuric acid to within an inch of the neck. Sand was then poured into the bath, reaching to about three-fourths the height of the body of the retort, the thermometer inserted into the tubulure, the connection made with the condenser, this with the tubulated receiver, and the latter with a tube leading into the chimney flue, by means of a rubber tube attached to a glass tube extending from the tubulure. All these connections were carefully wrapped with moist bladder, to secure them from leakage; for during the reaction there is an abundance of sulphurous acid developed, the inhalation of which must be avoided, not to speak of loss of product by escape from improperly secured connections. A glance at *Fig. 6* will show this arrangement better than can be done by description. Heat was now applied so that the temperature might rise as rapidly as possible to 155° , and then constant vigilance was necessary to maintain this temperature as near as possible, by the expedients previously mentioned. This is illustrated in the half-tone illustration (*Fig. 7*) in which the operator is evidently engaged in examining the thermometric indication. During the progress of this distillation a small quantity of liquid will collect in the receiver before there is any ebullition; then, when the proper temperature is reached, the contents will simmer gently; presently little black, frothy bubbles will make their appearance, and soon the entire sur-

face will be covered with a black froth, which increases in density and thickness until the operation is finished, this being indicated by the paucity of distillate dripping from the condensing tube into the receiver. The fire is then withdrawn, the fire door remaining open and the draught door closed, so that the sand bath and retort may cool rapidly. The receiver is disconnected, its contents, which sometimes are in two layers, but mostly in one homogeneous layer, are transferred to an open dish, loosely covered with paper, and allowed to remain for spontaneous evaporation over night. On the



FIG. 7.—Distillation of Heavy Oil of Wine.

following morning, this distillate, now reduced to a few ounces, is found in two layers—the lower is heavy oil of wine, the upper one mainly water, retaining a little sulphurous acid. The oil of wine, after washing with a little water, is then ready for use, and was usually at once converted into compound spirit of ether, of which large quantities were constantly in requisition. If the process was successful, the yield from $6\frac{1}{2}$ gallons of the mixture, consisting of equal volumes of alcohol and acid, was from 6 to 7 ounces of heavy oil of wine, while a solid crust of the carbonaceous frothy matter,

often two inches deep, remained on the surface of the acid liquid residue in the retort. If by any chance this solid crust was ruptured during the distillation, or if it failed to form, the contents of the retort invariably frothed over at some period during the 8 or 10 hours which, on an average, were consumed in the distillation.

The furnace in the rear of the stack enclosed a large kettle (*F*) which was used mainly for preparing solutions of saline compounds of various descriptions, such as liquor potassæ, the carbonates of soda and potash, etc., which in turn were used for a variety of purposes; the sodium carbonate for making

Solution of Chlorinated Soda, by admixture with solution of chlorinated lime in the huge tank or tub, capable of holding several hundred gallons, indicated by (*O*) in the northeast corner of the room, while the

Potassium Carbonate was purified by filtering the solution and evaporating it to dryness in shallow vessels on one of the furnace openings indicated by (*G*) on the western side of the stack. These openings were also provided with sand baths, on which, in shallow porcelain lined vessels, solution of

Potassium Acetate, previously prepared in stone-ware jars, was evaporated to dryness, and then, while still hot, filled into wide-mouthed, well-dried bottles, and immediately corked. A number of large wooden tubs, of 100 gallon capacity, indicated by (*n, n, n,*) were used mainly for the purpose of precipitating ferric hydroxide, this in turn being used for making

Citrate of Iron, most of this being converted into

Citrate of Iron and Quinine, of which immense quantities were in constant requisition. These solutions, after proper concentration, were transferred in earthen-ware jars to the scaling room, situated on the third floor of the main building, where a man was continuously employed in painting them on the surface of panes of glass, from which, after drying in a hot closet, they were removed in form of scales by simply tapping the glass edgewise on the surface of the work table, aided, under *unfavorable* conditions, by scraping with a spatula. The

Solution of Ferric Sulphate required for precipitating the ferric hydroxide was prepared in large enameled kettles on the furnace under a shed on the outside of the building, indicated by (*K*), this obviating the necessity of a fume chamber during the process of

oxidizing the ferrous sulphate solution with nitric acid. On this furnace

Monsel's Solution (Ferric Sulphate) was also prepared in large quantities, while

Solution of Ferric Chloride was oxidized on this furnace by the action of nitric acid on a solution of ferrous chloride, prepared by the direct action of hydrochloric acid on metallic iron (card teeth) and acidulated after filtration with the required amount of HCl.

Syrup of Squill was another preparation made on this furnace, mainly because of the facility offered by the crane (*L*) in placing the large enameled kettles used for boiling the syrup on the fire and again removing them. The last furnace to mention is that on the interior in the southeast corner of the room, indicated by (*H*). This was used for minor operations, such as making permanganate of potash, benzoic acid from benzoin by sublimation, etc., neither of which were prepared in appreciable quantities. Aside from occasional crucible operations, the kettles and sand baths being removable, these furnaces were used principally for boiling lead plaster. Finally

Gun Cotton was not the least important of the products turned out in the Furnace Room, notwithstanding, or possibly because of, its inflammable nature. This was made in large stone-ware jars, by the process then given in the U.S.P., which directed the immersion of the cotton in a mixture of nitrate of potash and sulphuric acid for twenty-four hours, at a certain temperature. I soon found, however, that operating in pound quantities was a very different problem from operating with ounces, that the prescribed temperature was probably within proper limits in pharmacopeial quantities, but totally beyond control when applied on a manufacturing scale. While engaged in the laboratory of the Messrs. Wyeth, I had an experience which served me a good purpose here. I had frequently prepared

Citrine Ointment, which at that time was directed to be made by the direct action of acid solution of mercuric nitrate on neatsfoot oil, with good success, obtaining a golden yellow ointment. Being required to make a quantity of 50 pounds or more, the whole quantity was started according to the official directions, the neatsfoot oil being brought to the required temperature. After the addition of the acid nitrate, reaction of course set in promptly; but it failed to

subside, became more violent from moment to moment, the mass began to froth, and continued to froth. A portion was removed into another vessel; it still frothed, and after filling several vessels (with bubbling froth), it finally subsided to form a dark brown unctuous mass, from which much of the mercury had separated in a metallic state—in short, a ruined ointment. I had learned my lesson, that mass has much to do with reaction; that a temperature suitable for small quantities had to be controlled by proper means when large quantities were taken in operation. It was so with gun cotton, but it manifested itself differently. It was found that after the cotton had been thoroughly imbued with the acid mixture, the conversion into soluble gun cotton was far more rapid than was indicated by the pharmacopoeial directions—this being doubtless due to the temperature generated during the reaction. If this action was permitted to continue, the soluble cotton became gradually converted into the less soluble and more explosive variety and, therefore, it was necessary to intercept the process at a point when conversion into soluble gun cotton was complete. The solution of this problem was quite simple. It consisted in removing a small plegget of the cotton from time to time, washing it quickly in water, immersing it twice in fresh portions of alcohol, expressing, and immediately shaking it in a test tube with a mixture of one volume of alcohol and three of ether. So long as the sample did not dissolve in this mixture, the action of the acid on the cotton was allowed to continue; but as soon as it dissolved perfectly and quickly in the ether-alcohol mixture, the reaction was intercepted by throwing the acid mass into a large quantity of water, then washing and treating it in the usual manner.

In the foregoing I have about outlined the work in which I was directly concerned. In order to round up, however, it may be of interest to mention that the entire second and third floors of the main building were occupied almost exclusively for bottling, labeling and wrapping the medicaments manufactured in the different departments; in the manufacture of roller bandages, the spreading of isinglass plaster, the rolling out of pills, and like operations, by a force of probably 150 women and girls, under the superintendence of Miss Maggie Davis. From here they were turned into the packing rooms, where they were boxed, transferred to the warehouse—

a large building situated on the northwest corner of Sixth and Master Streets—from whence they were delivered on the requisition of the Medical Purveyor. The spacious upper floors of this warehouse, extending through to Marshall Street, were used in the manufacture of sheets, pillow slips, and other similar hospital requisites, in which several hundred women and girls were engaged constantly to the end of the war.

In closing, I venture to express the hope that this necessarily imperfect account may prove of general interest, and particularly a welcome reminder to those who participated in the stirring events of the Civil War.

PROGRESS IN PHARMACY.

A QUARTERLY REVIEW OF SOME OF THE MORE IMPORTANT ADVANCES IN
PHARMACY AND MATERIA MEDICA.

BY M. I. WILBERT,
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The Food and Drugs Act, June 30, 1906, as the recently enacted pure food and drug law is now officially designated, still remains the favorite topic for discussion with all persons directly interested in the manufacture and sale of drugs and medicinal preparations.

The rules and regulations that have been adopted as a guide, in the proposed enforcement of the food and drugs act, have been published as Circular No. 21, by the United States Department of Agriculture, and may be obtained free, by any one interested, from the Secretary of Agriculture or from the Chief of the Bureau of Chemistry.

The far-reaching nature of the regulations that have been adopted is well illustrated by the definitions that are included in Regulation 28, concerning substances named in drugs and foods.

The term alcohol is defined to mean common or ethyl alcohol, either as "Cologne spirits, grain alcohol, rectified spirits, spirits or spirits of wine." As derivative of alcohol we have "aldehyde, ether, ethyl acetate, ethyl nitrite, and paraldehyde." Preparations containing alcohol are defined as not alone including galenical preparations but also brandies, whiskies and wines.

Among the morphine derivatives we find apomorphine, dionine,

peronine, and the salts of morphine; heroin, it will be remembered, is specifically mentioned in the act itself.

Among the preparations of cocaine we find a definition that will no doubt be objected to by some manufacturers. Coca leaves, and hence preparations made from coca leaves, are defined as being preparations containing cocaine or salts of cocaine.

Among the derivatives of chloral hydrate we find enumerated "chloral alcoholate, chloralamide, chloralimide, chloralose, dormiol, hypnal and uraline."

Under acetanilide we find, among a number of more direct derivatives, "citrophen, lactophenin and phenacetine."

The forty regulations that are embodied in the pages of Circular 21 are well worth the careful attention of pharmacists. Taken as a whole they have met with favorable reception by manufacturers and large dealers, and it is generally expected that by January 1st, the date when the law is to come in force, provisions will have been made for a general acceptance of the spirit as well as the letter of the law.

The blanket guaranty, permitted under Regulation 9, has been filed, by a number of manufacturers, and pharmacists will do well to arrange their dealing in accordance with the provisions of this regulation.

Denatured Alcohol.—Regulations No. 30. United States Internal Revenue. This is the title of a pamphlet comprising sixty pages descriptive of the regulations and instructions concerning denatured alcohol.

The production as well as the sale of this article appear to have been elaborately safeguarded. The denaturing of alcohol is to be done in bonded warehouses used for denaturing alcohol, and for no other purpose.

The sale of the product is limited to persons who secure the necessary permit from the Collector of Internal Revenue of the district in which the business is to be carried on. Dealers themselves are to be classed as wholesale dealers; selling the original stamped package, and retail dealers who may sell or offer for sale quantities of less than 5 gallons.

The product that will be for sale in the ordinary course of trade is that designed in the regulations as completely denatured alcohol. This consists of 100 parts by volume of ethyl alcohol of the required

proof, 10 parts by volume of methyl alcohol and 1 part of approved benzine.

Provision is also made for the use of specially denatured alcohol by certain manufacturers, not, however, by those engaged in the manufacture of liquid medicines or beverages.

N.A.R.D. Convention.—The annual convention of the National Association of Retail Druggists was held in Atlanta, Ga., October 1 to 5, 1906. The attendance at the meeting is said to have been unusually large and the interest in the proceedings keen, despite the fact that little but routine work was accomplished.

The report of the Committee on Resolutions, embodying as it does a review of the accomplishment as well as the prospective policy of the association, includes a large number of resolutions on widely varied subjects. Among the more prominent of these resolutions were expressions of opinion on the marketing of proprietary remedies, the endorsement of the so-called D.C.S.N. plan and recommendations to popularize U.S.P. and N.F. preparations with physicians.

The establishment of a National Buying Club was discountenanced and the general policy of local buying clubs ignored, as not coming under the jurisdiction of the National Association. The failure to secure the enactment of the Mann Bill was discussed at some length and the committee having the matter in charge were instructed to draft a bill that would obviate the shortcomings of this bill and still secure relief from the present abuses in connection with patents on medicinal substances.

N.W.D.A. Meeting.—The National Wholesale Druggists Association met in annual convention in the city of Washington, October 8 to 11, 1906. The members in attendance were more than usually interested in the reports of committees and in the discussion of trade subjects. Not the least interesting of the several subjects presented was the consideration of the recently enacted pure food and drug law.

From the available reports of the proceedings of the convention it would appear that the members present were generally favorable to the enforcement of this law, within reasonable limitations, and were willing to do all in their power to comply with its requirements.

The Pharmacopœia of the United States of America was discussed at some length and a special committee was appointed to secure

facts and data relating to shortcomings and impracticable requirements in this book and to report to the chairman of the Pharmaceutical Revision Committee requesting that the necessary changes be made at the earliest possible date.

Public Health Defence League.—This is the name that was tentatively adopted by the delegates who were present at a conference, to devise ways and means to protect the public health and morals, held in the Hudson Theatre, New York, on November 15, 1906. The Conference was held under the auspices of the Medical Society of the County of New York and was attended by upwards of three hundred delegates and persons otherwise interested.

The immediate object of the Conference was the formation of a national organization to obtain and to disseminate accurate information concerning practices and conditions that are dangerous to public health and morals and to combat these practices and abuses by the education and enlightenment of the public, the enactment of needed laws and by the temperate enforcement of existing laws and statutes.

The delegates present adopted a set of resolutions adopting or endorsing a proposed charter and continuing the Conference committee to effect a permanent organization.

German Naturalists and Physicians.—The seventy-eighth annual meeting of this organization was held this year in Stuttgart, from the 16th to the 22d of September. The Section for Pharmacy and Pharmacognosy of this association bears to pharmacy in Germany relatively the same position that the Section on Scientific Papers of the American Pharmaceutical Association does to pharmacy in our own country. The papers presented to this section this year were numerous but dealt largely with subjects of but secondary importance to the active pharmacist. In commenting on the nature of the communications that were presented this year the German pharmaceutical journals generally have deplored the ultrascientific character of these communications and the general lack of practical information more directly useful to the busy pharmacist in his every-day work.

Perkin Jubilee in America.—The celebration of the fiftieth anniversary of the discovery of the first aniline color, by Sir William Henry Perkin, which was held in London, in July, has been supplemented by a corresponding celebration in New York City, at which Sir William Henry Perkin was the guest of honor. One of the chief

features of this celebration was a dinner, on the evening of October 6th, presided over by Prof. Charles F. Chandler, at which upwards of 400 chemists and teachers were present.

Proprietary Remedies in Austria.—The pharmacists in Vienna, according to the *Pharmaceutische Post*, page 514, 1906, are taking an active interest in combating the popularization of proprietary remedies, that are being exploited there at the present time, by offering a line of desirable substitutes made by the pharmacists themselves.

The formulae for these preparations were devised by a local commission of pharmacists and an effort is now being made to interest other of the Austrian pharmaceutical societies in the plan.

Among the arguments that are being used to physicians to favor the new preparations is that they would be more economical to the patient, would prevent self-medication, and would avoid misleading advertising of other preparations direct to the public.

It is also pointed out how physicians could more readily control the purity and the composition of these open formula remedies, and, further, knowing the exact composition of the remedies, how they could be modified in appearance and taste to suit the idiosyncrasy of individual patients and thus retain their confidence and respect. Another feature of the same work that has been taken up by Austrian pharmacists is to point out to physicians how much more desirable it would be to have active medicaments dispensed in capsules or in cachets in preference to prescribing the commercial compressed tablets the activity of which is at best problematical.

German Pharmacopœia.—A new edition of the German Pharmacopœia is in course of preparation and invitations have been extended, by the commission having the revision in charge, for additions and corrections.

From the suggestions that have been made it would appear that there is little or no desire to have the style of the German Pharmacopœia changed in any way. There appears, however, to be a rather widespread feeling that the book should include official descriptions of a greater number of newer remedies.

A Proposed Imperial Pharmacopœia.—Donald McAllister, M.D., at the meeting of the British Medical Association, in Toronto, in 1906, in speaking of the lack of harmony in the various national pharmacopœias, suggested that the British Pharmacopœia should be broadened in scope so as to be adapted to the needs of all of the

nations included in the British Dominions. He invited discussion on the proposal with a view of developing the present British Pharmacopoeia into a generally acceptable Imperial Standard.

Alkaloids of Calumba Root.—Calumba root contains at least two bases allied to, but differing from berberine, which, as Gordin has pointed out, does not occur in this drug. Like berberine these bases are quaternary yellow alkaloids which are readily reducible to colorless tertiary hydro-compounds. One of these bases, Calumbamine, has been separated as a crystalline iodide. (*Phar. Jour.*, Sept., 1906, page 283.)

Aspirophen.—This is said to be amido-acet-paraphenetidin acetyl salicylate and is obtained by combining molecular quantities of acetyl salicylic acid and amido-phenacetin. The resulting compound is readily soluble in hot water but only sparingly soluble in water at ordinary temperatures. (*Phar. Zeit.*, 1906, page 808.)

Bactericidal Action of Silver Compounds.—C. R. Marshall and E. F. Macleod Neave, at the request of the Therapeutic Committee of the British Medical Association, made a comparative test of the various silver compounds in common use.

The percentage of silver in the several compounds was determined and subsequently solutions were made to contain definite proportions of silver. The experiments showed that so far as bactericidal action was concerned the several silver compounds investigated fall into one of three groups:

- (1) Powerfully bactericidal.
- (2) Slightly bactericidal.
- (3) Practically inert.

The first group includes the greater majority of well-known silver salts such as the nitrate, fluoride, citrate, lactate and a number of the organic compounds, such as casein silver, albargin, protargol, largin and novargan.

The second group contains but one preparation, nargol.

The third, or practically inert group, contains two—collargol and argyrol. (*Phar. Jour.*, Aug. 25, 1906, page 237.)

Citrocoll.—This is said to be neutral amido-phenacetin citrate. It is readily soluble in water and occurs as a white crystalline powder melting at 193° C. It has been recommended as an antipyretic, antirheumatic and a nervine. (*Phar. Zeit.*, 1906, page 865.)

Formurol.—Formurol is a trade name for hexamethylentetramin

sodium citrate, a white crystalline powder that is readily soluble in water and has a pleasant and agreeable taste. It is to be used in cases of gout and inflammatory conditions of the kidneys and urinary tract. Dose, 1 gramme two to five times a day. (*Phar. Centralh.*, 1906, page 777.)

Preservation of Hydrogen Peroxide by sodium or calcium chloride. Medicinal solutions of hydrogen peroxide are said to be preserved much longer by the addition of 1 per cent. of sodium or of calcium chloride than when the usual preservatives, inorganic acids, are employed. (*Phar. Jour.*, Sept. 1, 1906, page 263.)

Purgative Principles of Chinese Rhubarb.—According to E. Gilson (*Arch. de Phar. et de Therap.*), the purgative principles of Chinese rhubarb are glucosides which do not occur in the root as a mixture, but in the form of a kind of compound, which he names rheopurgarin.

This compound glucoside consists of chrysophanein, rheocrysin, emodin glucoside and rhein glucoside. Rheopurgarin is soluble in strong solutions of organic acids, which accounts for the prevailing opinion that the purgative principle is soluble in water. Chrysophanein has been isolated in a state of purity, and from it a new form of chrysophanic acid has been obtained. Rheocrysin is a new glucoside which is hydrolysed into dextrose and rheocrysidin. (*Phar. Jour.*, Sept., page 263.)

Purgier Konfekt.—This is another one of numerous trade names that have been applied to preparations of phenolphthalein, to be used as a laxative. Among the now numerous names that have been applied to phenolphthalein or dihydroxyphthalophenon and to preparations containing it, are paraphalein, purgen, purgo, purglets, purgella, purgolade, purgylum, probilin and laxirconfect. All of this, too, before the substance has appealed to the inventive faculties of the numerous manufacturers of proprietary specialties in our own country.

Quinine Acetyl Salicylate.—This is said to be a basic combination of these two substances and was obtained by L. Santi by dissolving, each, 378 grammes of quinine and 1,809 grammes of acetyl salicylic acid, in ether, and mixing the two solutions. The resulting white crystalline powder has an intensely bitter taste, melts at 157° and is soluble in 1,000 parts of water and in about 30 parts of alcohol.

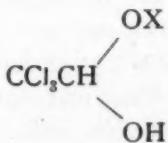
Attempts to produce the neutral acetyl salicylate of quinine were not successful.

The basic salt may be given in doses of 0.4 grammes. (*Phar. Centralh.*, 1906, page 831, from *Bullet. Chim. Farm.*)

Somnos.—A series of experiments on the physiologic action of somnos, in comparison with a 5 per cent. solution of hydrated chloral, published in the *Journal of the American Medical Association* (Sept. 15, 1906, page 872), lead to the conclusion that somnos, which is a solution of trichlorethidene propenyl ether, or chloral glycerinate, is practically indistinguishable, in its pharmacologic action, from a 5 per cent. solution of hydrated chloral.

The urine of rabbits which had been given somnos contained a levorotatory compound which reduced Fehling's solution readily. This substance is probably urochloralic acid, the same substance as is found in the urine after the administration of hydrated chloral.

An interesting reference to the history of the chloral compounds may be found in Bulletin No. 1 of the *American Pharmacologic Society*, and republished in *American Medicine*, for October, 1906, page 432. This reference says that the reaction of glycerin on chloral was studied qualitatively at least, as early as 1874. "Louis Henry, of Louvain, Belgium, in an article published in *Berichte der Deutschen Chemischen Gesellschaft*, VII (1874), page 764, states as follows with regard to chloral addition compounds: 'Chloral unites with energy with water and with alcohol to form compounds of the general types



in which X is a positive radical derived from a monatomic or polyatomic alcohol or an alcohol acid.' Henry says, in addition, 'I have established this fact with a large number of alcohol compounds, which by their nature and function were very different, as, for instance, with the polyatomic alcohols such as glycol, glycerin, the basic ethers such as ethylene chlorhydrin, glycerin dichlorhydrin, etc.,' and concludes: 'I believe that chloral can be considered to be a kind of reagent for all bodies with alcoholic nature.'"

Sophol.—This is said to be a combination of formic aldehyde, nuclein and silver and to contain 22 per cent. of metallic silver. It is soluble in water and is recommended as a substitute for other

organic preparations of silver. (*Chemist and Druggist*, Sept., 1906, page 462.)

The Formation of Cocaine in Coca Leaves, according to the investigation of K. de Tong, occurs mainly in young leaves. With the increase in the size and age of the leaf the alkaloid content decreases but is not totally absent even in dead leaves. (*Phar. Zeit.*, Sept., 1906, page 795.)

To Purify Drinking Water.—M. Lambert proposes to add 0.06 grammes of potassium permanganate to each liter of water. This should be left standing for ten minutes and then 0.10 of manganous sulphate added. The resulting mixture is then allowed to precipitate and the supernatant clear liquid decanted off. (*Chemist and Druggist*, Sept., page 389.)

Tulase.—This is the name that has been given by Professor Behring to his immunizing and curative serum for tuberculosis. This serum is now being furnished in an experimental way, for practical trial. (*Chemist and Druggist*, Sept., 1906, page 422.)

Tyree's Antiseptic Powder.—The report of a sub-committee of the Council on Pharmacy and Chemistry of the American Medical Association (*Jour. A.M.A.*, Oct. 20, 1906, page 1316) calls attention to the fact that while this preparation is advertised as being a mixture of sodium borate, and alum with phenol, thymol, glycerin, menthol, oil of eucalyptus and oil of gaultheria, it is, in reality, composed of approximately 15.5 per cent. of anhydrous zinc sulfate, 81.2 per cent. of boric acid and 0.5 per cent. of volatile matter consisting of a mixture of odorous materials sufficient to give the mixture its distinctive, characteristic odor.

SOLUTION OF HYDROGEN PEROXIDE CONTAINING ACETANILIDE.

BY CHARLES H. LAWALL.

The writer was recently very much surprised by having his attention called to several samples of hydrogen peroxide solution from different sources, all of which had a strong odor resembling nitrobenzol. Upon obtaining a sufficient quantity and shaking it out with ether, evaporating the solvent carefully and testing the residue

for nitrobenzol by reducing and testing for aniline, positive results were obtained.

Correspondence with the firms making the article in question revealed the interesting fact that the reaction which had been entirely ascribed to the presence of nitrobenzol, was due, in part at least, to the presence of acetanilide which had been used as a preservative agent in preventing the deterioration of the solution with the accompanying loss of oxygen.

Further investigation of the facts in the case showed that the practice was confined to a few manufacturers who had regarded it in the light of a trade secret until the approach of the period of the enforcement of the regulations of the Food and Drugs Act, which requires the labeling of all products containing acetanilide, made this condition no longer possible.

That the presence of small quantities of acetanilide does preserve the solution from decomposition was shown by the fact that several samples examined which were known to be at least four months old showed from 9.5 to 10.5 volumes of oxygen. These had originally been supposed to contain 10 volumes.

There would probably be no objection to the use of small quantities of acetanilide when the advantages of increased stability are considered, but the product should be labeled, as it will have to be after January 1, 1907, with the amount of the preservative stated on the label.

The most interesting fact in connection with the investigation of the subject is the production of the nitrobenzol-like odor referred to in the first part of this article. It requires about four months for the development of this odor, which is very pronounced and very characteristic.

The presence of acetanilide in the freshly made and odorless product can be detected by shaking out about 25 c.c. of the solution with a few cubic centimeters of chloroform, evaporating the latter to dryness and applying the isonitrile-test for the presence of acetanilide.

THE NEEDS OF THE COUNCIL.¹

BY W. A. PUCKNER, Chicago,
Secretary of the Council on Pharmacy and Chemistry of the American
Medical Association.

In taking up the discussion of "The Needs of the Council," I take it for granted that you are perfectly familiar with the conditions which led to the establishment of this advisory body, the Council on Pharmacy and Chemistry, by the American Medical Association, also that you are familiar with its function to furnish physicians with reliable information in regard to the newer and proprietary remedies, and with the advantages to be derived from the work of the Council by all those interested in honest medicine and pharmacy and in the well-being and health of the people.

The work of the Council may well be divided into two parts: First, that of securing information in regard to the nature, composition and value of medicine; and, second, the dissemination of this information. Especially in the first task are pharmacists in a position to give valuable aid to the Council.

Pharmacists have long been familiar with the various phases of the deceit and fraud practised in misleading or deceiving the medical profession, to the detriment of both patient and physician. While many instances are on record where the retail pharmacist has given publicity to flagrant cases of deception, in general he has done but little to check these practices, or, worse, has adopted them as his own to some extent. This is, perhaps, best illustrated by the very common practice of selling household remedies, the so-called "non-secrets," under a "pseudo firm-name;" a practice firmly established and so generally adopted that the wrong connected with it has been lost sight of. For wrong this practice is, since its only object is to hide the real origin of the article—to deceive the purchaser.

However, the pharmacist is not to be blamed for the conditions which prevail. As a rule he fought for legitimate pharmacy and only after he realized that his efforts were wasted, while those of the nostrum promoter appeared to receive the endorsement of physicians and the public, did he, in self-defence, adopt the methods of the latter.

As just stated, there are many instances on record where pharmacists have called attention to flagrant cases of deception, through

¹ Read before the Philadelphia Branch of the American Pharmaceutical Association, November, 1906.

publication in pharmaceutical journals and by papers presented to pharmaceutical societies. But much, if not all of this, was of little avail because of the limited publicity given it and by its failing, in many instances, to reach the class of persons primarily to be benefited, the physicians. There is even a feeling among pharmacists and chemists that it is beneath their dignity, or at least not to their credit, to aid in the exposure of frauds. I have before me now an offer by an eminent chemist to assist the Council in verifying the claims made for a proprietary article, who stipulates: "Would like to make it a condition of our doing this work that the matter end with our report to you." At the recent meeting of the American Pharmaceutical Association chemical analyses of effervescing salts were submitted showing that many were not true to their claimed composition. But while the result of the analyses could not be questioned, yet the analyst refers to them by number. Had names been mentioned the paper would probably not have been received by the Association. All this, because exposure of such dishonesty is not considered to be commendable work. Therefore, to "avoid trouble," associations and individuals hesitate to make public the truth and, by this, aid and foster the many fraudulent medicines offered for sale.

However, just as the public has become aware of the extent to which food adulteration has been carried and now demands to know the truth, so it is with medicine. The medical profession has come to realize that very many medicines on the market are not what it was led to believe them to be and that some are rank frauds. And now the truth is demanded. And just as the daily press no longer dares withhold the truth in regard to any product because its promoter occupies space in its advertising column, so the time is near when the editors of medical journals will no longer find it profitable to conduct their journals to the interest of their advertising patrons and in entire disregard to the best interest of their subscribers.

That failure to publish derogatory as well as commendatory reports of proprietary remedies is rapidly becoming obsolete is shown by the publication of analysis of acetanilid mixtures¹ and the report on organic silver salts² in a recent issue of the *British Medical*

¹ *Br. Med. J.*, 1906, Vol. II, p. 27.

² *Br. Med. J.*, 1906, Vol. II, p. 359.

Journal; by the reports of the examination of proprietary remedies carried out under the auspices and financial support of the Deutscher Apothekerverein and published in the *Apotheker Zeitung*; and by the publication in the *Druggists Circular*, and in other pharmaceutical journals, of reports of work done along these same lines. Similarly the Council on Pharmacy and Chemistry is now publishing in the *Journal of the American Medical Association* the result of its work.

Upon organization the Council adopted a set of rules for its guidance. (See page 500 of this JOURNAL.) Since the adoption of these rules a considerable number of proprietary articles have been considered. Descriptions of those articles which appeared to comply with these rules are now being published in the *Journal*. Later these are to be published in book form. Concurrently with the publication of approved articles, the Council is also publishing reports on articles which are offered to the medical profession under false claims.

Lack of publicity of the work of the pharmacist in advising physicians in regard to the medicines offered to them will in the future, therefore, not deter from such investigation. While it is taken for granted that the pharmacist will avail himself of the opportunities offered to act as advisers and protectors of the medical profession, it may not be amiss to point out somewhat more specifically some of the ways in which the pharmacist may and should aid the cause.

Criticism and Corrections of Preliminary Publication.—To some extent the acceptance of the articles which are now appearing in preliminary publications in the *Journal* was based on investigations made by or under direction of the Council, but it was largely based on evidence supplied by the manufacturer or his agent, or on statements taken from standard works of reference. It is, therefore, to be expected that statements will appear which are not in accord with the facts and that some articles have been accepted which do not comply with the rules. Also, some articles, acceptable at the present time, will be changed in composition or in the manner of their exploitation so as no longer to meet the requirements, and they should, of course, be dropped from the list of approved articles. Close scrutiny of the preliminary publication is, therefore, invited. The attention of the Council should be called to any false or misleading statement contained therein. It is suggested that the claims, as regards composition of articles, be verified by pharmacists when opportunity offers. The tests of identity, purity and strength, when

given, should be subjected to verification. If none are given they should be worked out, at least for the definite chemical bodies, since their ready and safe recognition is often of the greatest importance. The incompatibilities of new remedies should be studied and the physician advised of undesirable combinations. Finally, the Council must depend very largely on the pharmacist for its knowledge of the continued compliance of approved articles with rules 3 and 4.

The Aid of the Pharmacist in the Further Work of the Council.—New remedies are constantly being produced. While the vast majority will present no advance over older well-tried medicines and will soon be "withdrawn from the market," some remedies of real merit will appear from time to time, and these deserve a fair trial by the physician. It is the function of the Council to supply the physician with reliable information in regard to the composition and properties of the newer medicines so that he may know which are deserving of a trial at his hands. Here, too, the pharmacist is in a position to materially aid the Council in supplying information about the many new preparations introduced. Being thoroughly familiar with drugs he is often in a position to unmask some of the old nostrums which are being constantly introduced under new and attractive names or to early recognize the objectionable character of remedies which to the physician will appeal as new and wonderful.

The Chemical Laboratory of the A.M.A.—To aid the Council on Pharmacy and Chemistry in its work the trustees of the A.M.A. authorized the establishment of a chemical laboratory. As one of the functions of this laboratory it is proposed to use the available clerical force to collect, arrange, and finally disseminate information bearing on authentic or reliable data regarding the composition of nostrums.

In the past there has been a disposition on the part of physicians and pharmacists to ignore the evil associated with the indiscriminate use of medicine. While perfectly familiar with the many frauds connected with the exploitation of so-called patent medicines, these conditions have been considered as a matter of course. While the harm often done was recognized, yet as a whole this class of remedies was considered beneath the notice of the physician and pharmacist. The frauds connected therewith were considered a "joke." I recall a conversation where the "Scotch Essence of Oat" outrage was referred to as "a joke on the public," because in the hope of experiencing

the effects of oats "as do horses" its consumers instead became addicted to the use of morphine. Truly a ghastly joke!

But, as with the adulteration of foods so with patent medicines, the public is beginning to realize the extent to which it has been duped. It rests with physicians and pharmacists to advise and instruct the public in regard to the household remedies and proprietary medicines which may be used with comparative safety, and to warn against those which are harmful or worthless. That the physician is cognizant of the duty before him is shown by the many inquiries in regard to the composition of nostrums. It is hoped that individual pharmacists, pharmaceutical associations and schools of pharmacy will take an active part in this work of the Council and will liberally assist the proposed bureau in obtaining reliable information as regards the composition of all nostrums, whether offered to physicians or to the public.

PHARMACEUTICAL MEETING OF THE PHILADELPHIA COLLEGE OF PHARMACY.

The second of the series of pharmaceutical meetings for the season of 1906-07 was held in the museum of the college on Tuesday afternoon, November 20th, with Mr. E. M. Boring, a member of the Board of Trustees of the college and a well-known pharmacist, in the chair.

The first item on the program was the report of the Committee on Shorter Hours and Sunday Closing. Mr. R. W. Cuthbert, chairman of this committee of the college, reported as follows:

There has been no definite plan formulated by our committee to bring about shorter hours and Sunday closing, but I think the outlook is brighter than ever. Many men are giving the question thoughtful consideration and some are in favor of it who, at one time, looked at it with disapproval. I hope that the committees will continue to work for the cause and that other committees will be formed. The town is too large to work as a whole, so I would suggest that we work in sections. If we get the matter started the interest will grow, and ways that we don't think of now may open up for the prosecution of the work. We want the suggestions and help of all who are interested. I am deeply interested in the matter and will do all I can to bring about results.

The subject was discussed by a number of members present. Mr. Thomas H. Potts said that he thoroughly believed in agitating this

subject and thought that each individual must act for himself. He showed how he had acted independently of others in closing his store part of the time on Sunday and in closing earlier in the evenings and said that other pharmacists in his neighborhood were now doing the same thing. Mr. Warren H. Poley agreed with Mr. Potts and said he thought the subject is one more or less dependent upon the individual as well as a local one. Dr. Lowe said that he thought that more might be done in the matter of Sunday closing. Mr. Wilbert said that the subject was not only attracting attention in this country, but was being discussed in very many European countries, including Germany. Mr. Evan T. Ellis said that before he went out of business, in 1875, the druggists in his neighborhood entered into an agreement to have one store open each Sunday while the others remained closed. Professor Kraemer called attention to the strength of the movement in Philadelphia and said that a number of pharmacists who had declared positively that they could not afford to close their stores on Sunday were now leading movements in various sections of the city to secure a thorough co-operation among neighboring pharmacists. In view of the importance of the matter Professor Kraemer moved the continuance of the committee with power to name sub-committees in various sections and to report on the progress of the movement from time to time.

Prof. Charles H. LaWall read a paper on "Nitro-benzol in Hydrogen Peroxide." The paper was discussed by Professor Lowe and E. M. Boring. (See page 582.)

Mr. Edward Post presented a paper on "The Manufacture and Commerce of Corks," which will be printed in a subsequent issue of this JOURNAL. The paper was illustrated with a fine collection of corks and cork products, which was presented to the college. Mr. Poley moved a vote of thanks to Mr. Post for his interesting paper and to the Armstrong Cork Company for the collection of corks, which motion carried.

Mr. M. I. Wilbert presented a "Quarterly Review on the Progress in Pharmacy." (See page 574.)

Mr. E. M. Boring called attention to a questionable medical advertisement in one of the leading daily Philadelphia newspapers. Professor Kraemer also called attention to a two-column article giving prescriptions in one of the recent Sunday papers, and moved the appointment of a committee to consider the subject of medical adver-

tisements and medical advice in the daily newspapers and to report at a later meeting. Professor Kraemer then exhibited a specimen of licorice grown by the late Henry N. Rittenhouse, and presented the following books to the college:

The second edition of Prof. Rudolf Kobert's "Lehrbuch der Intoxicationen;" the second report of the "Wellcome Research Laboratories at the Gordon Memorial College, Khartoum;" and "Conference of London Chemists Association and Burroughs-Wellcome Company."

The following provisional program has been arranged for the Pharmaceutical Meeting on Tuesday evening, December 18th:

"The Systematic Management of a Retail Pharmacy." By Mr. Harry B. Mason, of Detroit.

"A Special Form of Check for Paying Bills." By Harry C. Blair, Ph.G.

"The Retort Courteous." By C. L. Bonta, P.D., A.M.

"A Simple System for Personal Accounts." By E. Fullerton Cook, P.D.

"The Possibilities of Professional Pharmacy." By William C. Wescott, Ph.G.

An exhibit will be made by the manufacturers of special devices for simplifying accounting, the keeping of records, etc.

FLORENCE YAPLE,
Secretary pro tem.

OBITUARY.

Albert E. Ebert, a life-long pharmacist and a prominent member of the American Pharmaceutical Association, died at St. Luke's Hospital, Chicago, where he was taken for an operation for appendicitis, on Tuesday, November 20th. Mr. Ebert was 66 years of age, having been born in Germany in 1840. The next year his parents came to this country, and in 1852 he was apprenticed in the drug business and graduated from the Philadelphia College of Pharmacy in 1864. In 1867 he received the degree of Doctor of Philosophy in Munich where he was the student of Liebig.

Mr. Ebert engaged in the drug business in Chicago in 1868, and was actively engaged as a retail pharmacist until the time of his death. He was much interested in the advancement of American pharmacy and occasionally wrote papers on practical subjects. One of the last of his original papers was on the subject of "The Manufacture of Deodorized Opium and Tincture," and was published in this JOURNAL in 1902. One of his earliest papers was on this same subject, published over thirty-five years ago.

INDEX¹

TO VOLUME 78 OF THE AMERICAN JOURNAL OF PHARMACY.

AUTHORS.

| | |
|--|----------|
| Arny, H. V., and T. M. Pratt. Estimation of caseine | 121 |
| The inorganic chemicals of the U.S.P., VIII | 10 |
| Asher, Philip. Assay of opium and its preparations | 262 |
| Attfield, John. Letter from, on Procter Monument Fund | 448 |
| Beates, Henry, Jr. Remarks at the organization meeting of the Philadelphia Branch of the American Pharmaceutical Association | 328 |
| Beringer, George M. Acetone collodions | 470 |
| Campbell, Theodore. Practical experience with Sunday closing | 518 |
| Cheney, F. L. Extemporaneous sulphurous acid | 333 |
| Cliffe, W. L. Practical experience with Sunday closing | 517 |
| Coblentz, Virgil. Comments upon the U.S.P. inorganic chemicals | 303, 387 |
| Cohen, Solomon Solis. Function of the true pharmacist | 325 |
| Conwell, Joseph A. Practical experience with Sunday closing | 518 |
| Cook, E. D. Practical experience with Sunday closing | 522 |
| Cook, E. Fullerton. Abstracts from theses on pharmaceutical subjects | 417 |
| and Charles H. LaWall. Liquor cresolis compositus | 169 |
| Cuthbert, R. W. Sunday closing and shorter hours | 503 |
| Diehl, C. Lewis. United States Army Laboratory | 559 |
| Eccles, R. G. Professor Wiley on food preservatives in North Dakota | 335 |
| Ehman, J. W. Abstracts of theses on chemical subjects | 333, 416 |
| England, Joseph W. The mental necessity of an early closing movement, | 505 |
| Syrup of wild cherry, U.S.P., 1900 | 267 |
| Tincture of nux vomica, U.S.P., 1900 | 527 |
| Eshner, Augustus A. The interdependence of medicine and pharmacy | 236 |
| Gabell, C. P. The protection that should be afforded the pharmacist by law | 91 |
| Gordin, H. M. The alkaloidal assays of the U.S.P., 1900 | 453 |
| Some alkaloidal assays | 458 |
| with W. H. Harrison. Separation of morphine from its solution in glycerin | 464 |
| Harrison, W. H., and H. M. Gordin. Separation of morphine from its solution in glycerin | 464 |
| Holm, Theodore. The root structure of <i>Spigelia marilandica</i> , <i>Phlox ovata</i> and <i>Ruellia ciliosa</i> | 553 |
| Kraerner, Henry. The Procter memorial | 420 |
| The use of metallic copper for the purification of drinking water | 140 |
| LaWall, Charles H. The duty of the pharmacist to aid in the elimination of irregular practices | 465 |

¹ Compiled by Florence Yaple.

| | |
|--|--------------------|
| LaWall, Charles H. Report of the Pennsylvania State Pharmaceutical Association meeting | 365 |
| solution of hydrogen peroxide containing acetanilide | 582 |
| and E. F. Cook. Liquor cresolis compositus | 169 |
| Leffmann, Henry. The U. S. Pharmacopoeia from the point of view of the analyst and as a legal standard | 77 |
| Oldberg, Oscar. Education and legislation in pharmacy | 472 |
| Perrédès, P. E. F. London botanic gardens . 1, 68, 113, 172, 224, 270, 317, 353 | |
| Pratt, Joseph H. The "Home Sanatorium" treatment of consumption | 422 |
| Pratt, T. M., and H. V. Arny. Estimation of caseine | 121 |
| Puckner, W. A. The needs of the Council | 584 |
| Redsecker, J. H. Practical experience with Sunday closing | 523 |
| Sadtler, Samuel P. The origin of fusel oil in spirits | 40 |
| Schimmel & Co. The essential oils of the United States Pharmacopoeia | 253 |
| Schimpf, Henry W. A critical review of the inorganic chemistry of the new United States Pharmacopoeia | 18 |
| Searby, W. M. Notes on the new Pharmacopoeia | 203 |
| Shearer, William R. Liquor chlori compositus | 333 |
| Slade, Henry B. Studies in plant mutation | 311 |
| Smith, F. A. Upsher. Prof. John Attfield | 103 |
| Steele, David M. Sunday rest as a religious institution | 508 |
| Stevens, A. B. Biographical sketch of Prof. A. Tschirch | 38 |
| Japanese lac (Ki-urushi) | 53 |
| Thrush, M. Clayton. The eighth decennial revision of the U. S. Pharmacopoeia from a physician's standpoint | 30 |
| Thum, John K. The debasing influence of monotony | 514 |
| Toplis, William G. Elixir aromaticum | 332 |
| Pasting labels on tin | 332 |
| Weidemann, C. A. Practical experience with Sunday closing | 516 |
| Wilbert, M. I. Benjamin Franklin | 214 |
| Doses in the U.S.P. | 87 |
| Nascent silver iodide | 54 |
| Progress in pharmacy | 129, 280, 428, 574 |
| Resumé of criticisms of the U.S.P. | 403 |
| Wiley, H. W. The use of preservatives in food | 153 |
| SUBJECTS. | |
| Abrastol, detection of | 381 |
| Acetanilid in bromo-seltzer | 138 |
| in hydrogen peroxide (LaWall) | 582 |
| Acetone collodions (Beringer) | 470 |
| Acetone in making oleoresins | 412 |
| Acid, acetic, diluted, examination of samples (Seidman) | 417 |
| boric | 18, 388 |
| detection and estimation of | 351 |
| examination of samples (Butler) | 417 |
| hydrobromic | 388 |
| hydrochloric | 388 |
| hydrocyanicum dilutum | 18 |
| propylbarbituric | 439 |
| phosphoric | 388 |
| stearic, melting point | 415 |
| sulphuric | 387 |
| sulphurous | 20, 389 |
| extemporaneous (Cheney) | 333 |

| | |
|---|-------------------------------------|
| Aconite, discrepancy in dose of preparations | 409 |
| Adulterations, report of committee of Pennsylvania Association | 368 |
| Advertising, effective method for retail pharmacists | 386 |
| Albumin, artificial | 138 |
| Alcho | 183 |
| Alcohol, denatured (Regulations No. 30) | 575 |
| sale of narcotics and of proprietary medicines containing (Model law) | 145 |
| Aloin, specifications of the U.S.P. too rigid | 412 |
| Alum | 390 |
| Alumini sulphas | 391 |
| American Medical Association, fifty-seventh annual session | 342 |
| Pharmaceutical Association, fifty-fourth annual meeting | 480 |
| program for meeting, September, 1906 | 399 |
| Philadelphia Branch, minutes of meetings | 291, 328, 340, |
| 400, 501, | 551 |
| (Organization meeting) | 198 |
| (Preamble and rules) | 246 |
| Procter Monument Fund | 352, 401, 452 |
| Ammonium, benzoate | 391 |
| carbonate | 391 |
| compounds, detection of | 380 |
| salicylate | 391 |
| Amyl nitrite, U.S.P. tests, unsatisfactory | 413 |
| Antimony oxide | 392 |
| Aqua | 392 |
| distillata | 392 |
| Army Laboratory, United States (Diehl) | 559 |
| Aromatic waters | 282 |
| Arsenic, pharmacopoeial tests for (Coblentz) | 305, 414 |
| Arseni iodidum | 393 |
| Arsenic trioxide | 392 |
| Aspirophen | 579 |
| Assay,aconite | 408 |
| opium and its preparations (Asher) | 262 |
| pepsin | 377 |
| Assay processes, possible danger in | 407 |
| commended | 407 |
| Assays, alkaloidal, of the U.S.P., 1900 (Gordin) | 453, 458 |
| use of iodeosin in | 377 |
| volumetric, of the U.S.P. (Arny) | 16 |
| Attfield, Professor John. Biographical sketch (Smith) | 103 |
| Atomic weights | 283 |
| Balm of gilead buds, powdering (Boring) | 349 |
| Barutine | 138 |
| B-eucain, toxic symptoms following use of | 283 |
| Board of Pharmacy, Illinois | 185 |
| North Carolina | 184 |
| Ohio, notice to registered pharmacists and assistant pharmacists | 395 |
| Boards of Pharmacy, Joint Conference | 486 |
| program | 337 |
| recommendations | 544 |
| National Association | 337 |
| Benzosalin | 283 |
| Borax in the United States, production of | 136 |
| Botanic gardens, London (Perrédès) | 1, 68, 113, 172, 224, 270, 317, 353 |
| Bromides, tests for, in Pharmacopœia | 394 |
| determination of chlorides difficult | 414 |
| Bromine, assay of | 395 |
| in the United States, production of | 137 |

| | |
|---|----------|
| Bromo-seltzer, acetanilid in | 138 |
| Buying, co-operative, advantages of | 494 |
| objections to | 495 |
| results of | 494 |
| | |
| Cactus grandiflorus, chemical examination | 490 |
| Calumba root, alkaloids of | 579 |
| Caseine, estimation of (Arny and Pratt) | 121 |
| Cataplasma kaolina | 410 |
| preparation of (Flack) | 419 |
| Celluloid, non-combustible | 282 |
| Chelsea Physic Garden (Perrédes) | 353 |
| Chloral addition compounds | 581 |
| Cigars, sale of, by pharmacists (Moore) | 374 |
| Cinchona, history and cultivation | 137 |
| Java | 99, 137 |
| Circulatory displacement in making pharmaceutical preparations | 493 |
| Citrocoll | 579 |
| Coal-tar industry, jubilee | 450 |
| Cocaine in coca leaves, formation of | 582 |
| Codex, the new French | 135 |
| Collodions, acetone (Beringer) | 470 |
| Conference of teaching faculties | 400 |
| Consumption, the "Home Sanatorium" treatment of (Pratt) | 422 |
| Copper in distilled water, detection of small traces of | 282 |
| in the purification of drinking water (Kraemer) | 140 |
| Cocoas, examination of commercial | 489 |
| Corosuccin | 438 |
| Council on pharmacy and chemistry, needs of (Puckner) | 584 |
| Counter-prescribing and its relation to public health (Coplin) | 341 |
| Cresol, compound solution of (LaWall and Cook) | 100, 169 |
| tests for | 377 |
| | |
| Digestive ferments, a digest of the | 377 |
| Diner, Jacob (Personal) | 402 |
| Distilled water, detection of small traces of copper in | 282 |
| Drugs, outline of A. O. A. C. work on, 1905 | 44 |
| | |
| Early closing movement, the mental necessity of an (England) | 505 |
| Education in pharmacy | 386 |
| and legislation in pharmacy (Oldberg) | 472, 530 |
| Electro-chemistry at Niagara Falls | 136 |
| Elements, new (Crookes) | 438 |
| Elixir adjuvans | 411 |
| aromaticum (Toplis) | 332 |
| ferri, quininæ et strychninæ phosphatum (Hughes) | 420 |
| simple, as a vehicle in children's prescriptions | 373 |
| Eriodictyon, chemical examination of | 488 |
| Estoral | 439 |
| Examination of pharmaceutical substances | 379 |
| Extract, fluid staphisagria; a useless preparation | 410 |
| | |
| Flora of the Lickey Hills (B. P. C. paper) | 435 |
| Flutol | 283 |
| Food and Drugs Act | 574 |
| Formula bill | 130 |
| Franklin, Benjamin, his influence on the progress of the science of medicine in America | 214 |
| bi-centenary (1706-1906) | 240 |

| | |
|--|-------------------------------------|
| Food preservatives in North Dakota, Professor Wiley on (Eccles) | 335 |
| Furmurol | 579 |
| Fusel oil in spirits, the origin of (Sadlier) | 40 |
| | |
| Gaultherine | 283 |
| Gelsemium, chemical examination | 489 |
| Gentiana lutea (illustration), (Perrédès) | 116 |
| German naturalists and physicians | 577 |
| Glycerin, detection of small quantities of copper and iron in | 490 |
| Granular effervescent salts, new method of preparation | 377 |
| Grindelia, botanical characters of some California species | 488 |
| | |
| Historical material, a prescription book used in Raleigh, N. C., during the Civil War | 496 |
| Histosan | 139 |
| Hydrogen peroxide, preservation by acetanilide (LaWall) | 582 |
| sodium or calcium chloride | 580 |
| | |
| Influence of monotony, the debasing influence of (Thum) | 514 |
| Iodine, chloroform solutions of | 139 |
| | |
| Japanese lac (Stevens) | 53 |
| Jasmiflorin | 284 |
| | |
| Ki-urushi (Japanese lac), (Stevens) | 53 |
| Kolatine | 284 |
| Kremers, Edward (Personal) | 351 |
| | |
| Labels on tin, pasting (Toplis) | 332 |
| discussion | 347 |
| Lac, Japanese (Stevens) | 53 |
| Laudanum, Sydenham's | 493 |
| LaWall, Charles H. (Personal) | 402 |
| Liquor chlori compositus (Shearer) | 333 |
| cresolis compositus (La Wall and Cook) | 100, 169 |
| Lloyd library (Walker bequest) | 452 |
| Lloyd, John Uri (Personal) | 351 |
| London botanic gardens (Perrédès) | 1, 68, 113, 172, 224, 270, 317, 353 |
| | |
| Magnesia, citrate of, effervescent solution of | 385 |
| Magnesium carbonate, examination of samples (Du Bois) | 416 |
| McIntyre, William (Personal) | 152 |
| Medicinal plants, wild, of the United States | 152 |
| Medicine and pharmacy, the interdependence of (Eshner) | 236 |
| Methylene blue, color test for | 490 |
| Metric units, abbreviation for | 437 |
| Milk sugar, detection of cane sugar in | 380 |
| Mistura glycyrrhizae composita, preparation of (Bell) | 418 |
| Morphine, separation of, from its solution in glycerin (Gordin and Harri- son) | 464 |
| | |
| Names, fancy, the plague of | 438 |
| Narcotics, sale of, and of proprietary medicines containing alcohol (Model law) | 145 |
| N. A. R. D. Convention | 576 |
| National Association of Retail Druggists—How it has benefited the retail pharmacist (Potts) | 387 |
| National Formulary | 435 |
| New and non-official remedies | 499 |

| | |
|---|---------------|
| Nitrates, precipitant for | 380 |
| Nitron | 139 |
| N. W. D. A. meeting | 576 |
| Obituary Notices.—Bley, John | 550 |
| Bolton, Joseph P. | 550 |
| Brodie, Robert C. | 550 |
| Cramer, Henry | 550 |
| Dobbins, Edward Tonkin | 550 |
| portrait of (Frontispiece to November issue) | 503 |
| Ebert, Albert E. | 590 |
| Fritzsche, Herman T. | 452 |
| Koch, Louis | 551 |
| Shryock, Allen | 551 |
| Oil, castor, preparation of tasteless | 385 |
| Oils, essential, assayed | 409 |
| Oldberg, Arne (Personal) | 402 |
| Oscar (Personal) | 300 |
| Oleoresins, acetone in making | 412 |
| Omoral | 439 |
| Opium and its preparations, assay (Asher) | 262 |
| Otto of rose (Lloyd) | 488 |
| Ovogal | 439 |
| Patent and proprietary medicines | 281 |
| Patent medicine agents or prescription compounders | 382 |
| Patent medicines, present status of | 382, 383, 384 |
| Pepsin, the activity of | 434 |
| Perkin memorial committees | 300 |
| Jubilee in America | 450, 577 |
| Pharmaceutical Association, American | 301 |
| Missouri | 301, 351 |
| Ohio | 301 |
| Pennsylvania | 301 |
| report (LaWall) | 365 |
| Pharmaceutical faculties, the American Conference of | 48, 337, 541 |
| Pharmacist, functions of the true (Cohen) | 325 |
| the duty of, to aid in the elimination of irregular practices (LaWall) | 341, 465 |
| the protection that should be offered the, by law (Gabell) | 91 |
| Pharmacists, Belgian, decorated | 436 |
| the French military | 282 |
| Pharmacopoeia, American, essential oils (Schimmel & Co.) | 253 |
| Austrian | 134, 436 |
| Belgian | 436 |
| Dutch | 281 |
| French | 135 |
| German | 578 |
| Imperial (Proposed) | 578 |
| Spanish | 133 |
| United States, Board of Trustees (sixth annual meeting) | 302 |
| alkaloidal assay processes (Moerk) | 379 |
| assays of (Gordin) | 453, 458, 464 |
| business affairs | 183 |
| from a physician's standpoint (Thrush) | 30 |
| from point of view of analyst and as a legal standard (Leffmann) | 77 |
| discussion | 99 |
| chemicals, inorganic (Arny) | 10 |
| of the U.S.P. (Coblentz) | 303, 387 |
| (Schimpf) | 18 |

| | |
|---|----------|
| Pharmacopoeia, United States, discussion on (Remington) | 150, 374 |
| doses | 376 |
| doses in (Wilbert) | 87 |
| essential oils (Schimmel & Co.) | 253 |
| notes on the new (Searby) | 203 |
| popularizing, with physicians | 132 |
| résumé of criticisms (Wilbert) | 403 |
| Spanish edition | 133 |
| the physician and the | 378 |
| Pharmacy and medicine, the interdependence of (Eshner) | 236 |
| Phenol, tests for | 377 |
| Phlox ovata, root structure (Holm) | 553 |

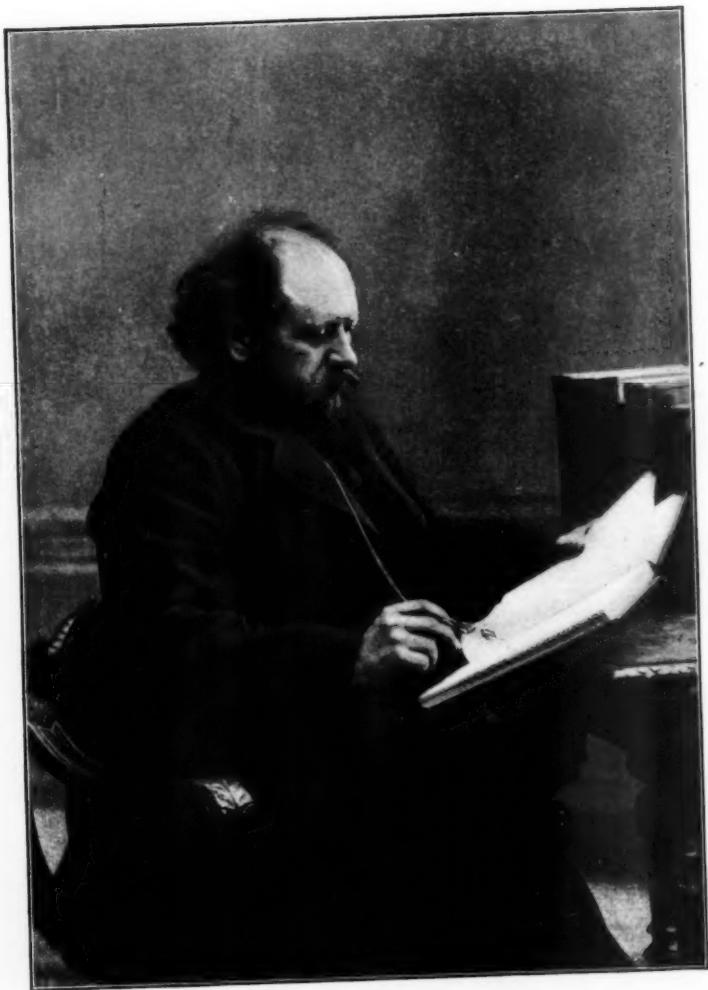
PHILADELPHIA COLLEGE OF PHARMACY.

| | |
|--|-----------------------------|
| Alumni Association | 299, 346 |
| annual meeting | 248 |
| commencement, the eighty-fifth | 293 |
| committee on necrology, report of deceased members | 549 |
| honorary members elected | 548 |
| minutes of board of trustees | 101, 248, 397, 548 |
| minutes of December, 1905, meeting | 101 |
| minutes of June meeting | 396 |
| minutes of semi-annual meeting | 548 |
| presentation of journals (McIntyre) | 397 |
| pharmaceutical meetings | 98, 149, 201, 346, 519, 588 |
| preliminary education | 186 |
| scholarship by E. T. Dobbins | 397 |
| sermon, Baccalaureate | 299 |
| supper, faculty | 299 |
| Plant constituents, collection of | 402 |
| mutation, studies in (Slade) | 311 |
| Potassium, detection of | 380 |
| Preparations, popularizing standard | 384 |
| Preservation of medicinal and chemical properties | 138 |
| Preservatives in food, use of (Wiley) | 153 |
| discussion on | 201 |
| Procter memorial (Kraemer) | 420 |
| circular by committee of A.Ph.A. | 285 |
| Procter monument fund | 352, 401, 452 |
| letter from Professor Attfield | 448 |
| Progress in pharmacy (Wilbert) | 129, 280, 428, 574 |
| Proposal | 139 |
| Proprietaries, prescribing of | 131 |
| Proprietary medicine label bills | 130 |
| medicines containing alcohol, sale of narcotics and of (Model law) | 145 |
| remedies in Austria | 578 |
| Proprietaries, sale of intoxicating | 131 |
| Protosal | 139 |
| Public Health Defense League | 577 |
| Pure food bill, the national (text of) | 430, 440, 574 |
| Purgier Konfekt | 580 |
| Quinine acetyl salicylate | 580 |
| Redsecker, J. H. (Personal) | 152 |
| Remington, Joseph P. (Personal) | 300 |
| Resin, phosphorated, determination of phosphorus in | 490 |
| Rest and recreation as a physical necessity (Flick) | 519 |

REVIEWS, BOOK :

| | |
|---|---------------|
| Analytical chemistry (Muter) | 197 |
| Annales de l'institut colonial de Marseille | 449 |
| Annual laboratory report of the Smith, Kline & French company | 452 |
| Bacteria in relation to plant diseases (Smith) | 96 |
| Commentary on the eighth revision of the U. S. Pharmacopoeia (Francis) | 451 |
| Electro-chemistry of organic compounds (Löb) | 192 |
| Elements of applied microscopy (Winslow) | 238 |
| Elements of physical chemistry (Morgan) | 191 |
| Follies of science at the court of Rudolph II (Bolton) | 43 |
| Grundzüge der chemischen Pflanzen-Untersuchung (Rosenthaler) | 239 |
| Lehrbuch der Intoxikationen (Kobert) | 448 |
| Materia medica, pharmacy and theapeutics (Potter) | 196 |
| Materia medica (Squibb's) (Stevens) | 291 197 |
| Methods of organic analysis (Sherman) | 238 |
| Microscopy of vegetable foods (Winton) | 237 |
| The modern materia medica (<i>The Druggists' Circular</i>) | 451 |
| National formulary | 351 |
| New and non-official remedies (council on pharmacy and chemistry of the American Medical Association) | 499 |
| Neue Arzneimittel organischer Natur (Rosenthaler) | 198 |
| Practice of pharmacy (Remington) | 95 |
| Proceedings of the A. Ph.A. | 351 |
| Progress in alkaloidal chemistry (Gordin) | 452 |
| Qualitative chemical analysis (Schimpf) | 193 |
| Quiz-compends | 239 |
| Select methods in food analysis (Leffmann and Beam) | 195 |
| Text-book of chemistry (Jones) (Sadler and Coblenz) on medical and pharmaceutical chemistry (Bartley) | 198 546 |
| on pharmacy (Caspari) | 151 |
| of physiological chemistry (Long) | 199 |
| Whys in pharmacy (Ruddiman) | 194 |
| Rheum officinale (Illustration) | 356 |
| palmatum (Illustration) | 356 |
| Rhubarb, purgative principles of | 580 |
| Ruellia ciliosa, root structure (Holm) | 553 |
| Rusby, H. H. (Personal) | 152, 300, 452 |
| Sadtler, Samuel P. (Personal) | 52 |
| Salene | 284 |
| Salicin versus salicylates | 439 |
| Salol, acetyl- | 284 |
| Sambunigrin | 439 |
| Santyl | 140 |
| Scholarship and prizes, the Fairchild | 52 |
| Searby, William M. (Personal) | 301 |
| Secret remedies, exclusion of, from North Dakota The British Medical Association and | 438 437 |
| Self-medication, limitations of (Neilson) | 340 |
| Shorter hours and a day for rest | 501, 503-527 |
| Show-windows in suburban sections | 381 |
| Sidonal, new | 439 |
| Silver compounds, bactericidal action of | 579 |
| Silver iodide, nascent (Wilbert) | 64 |
| Soda fountain | 386 |
| Sodium phosphate, examination of samples (Shomo) | 416 |

| | | |
|--|-----------|-----|
| Solution of cresol (LaWall and Cook) | 100 | 169 |
| lead subacetate, preparation of (Thompson) | 416 | 416 |
| of hydrogen peroxide containing acetanilide (LaWall) | 582 | 582 |
| Somnos | 581 | 581 |
| Sophol | 583 | 583 |
| Spigelia marilandica, root structure (Holm) | 551 | 551 |
| Spirit of nitrous ether | 376 | 376 |
| peppermint, preparation | 373 | 373 |
| Stovain, poisoning by | 283 | 283 |
| Strophanthus and strophanthin | 434 | 434 |
| Strychnine, oxidation compounds of | 438 | 438 |
| Styralcol | 440 | 440 |
| Sulphates, volumetric determination of | 380 | 380 |
| Sulphopyrine | 440 | 440 |
| Sunday closing and shorter hours (Cuthbert) | 503 | 503 |
| discussion | 501, 503, | 527 |
| practical experience with (Campbell) | 518 | 518 |
| (Cliffe) | 517 | 517 |
| (Conwell) | 518 | 518 |
| (Redsecker) | 523 | 523 |
| (Weidemann) | 516 | 516 |
| rest as a religious institution (Steele) | 508 | 508 |
| Suppositories, discussion on making | 347 | 347 |
| glycerinated gelatin, preparation of (Scatchard) | 419 | 419 |
| preparation (Foster) | 417 | 417 |
| Suprarenal gland, preparation of solutions of the active principle | 489 | 489 |
| Syrup of wild cherry, U.S.P., 1900 (England) | 267 | 267 |
| Takamine, Jokichi (Personal) | 300 | 300 |
| Toxicatin | 284 | 284 |
| Theophorin | 440 | 440 |
| Theobrominlithium | 284 | 284 |
| Thiobromose | 284 | 284 |
| Theses on chemical subjects, abstracts of (Ehman) | 333, 416 | 416 |
| pharmaceutical subjects, abstracts of (Cook) | 417 | 417 |
| Thymol iodide, preparation of | 378 | 378 |
| Tincture of iodine, preparation | 374 | 374 |
| nux vomica, U.S.P., 1900 (England) | 527 | 527 |
| opium, a comparison of the seventh and eighth U.S.P. requirements for morphine | 491 | 491 |
| Tinctures from fluid extracts | 373 | 373 |
| Tooth-pastes, formulas for (Blair) | 372 | 372 |
| Tschirch, A., biographical sketch of (Stevens) | 38 | 38 |
| Tulase | 582 | 582 |
| Tyree's antiseptic powder | 582 | 582 |
| Veratrum viride (Illustration), (Perrédes) | 117 | 117 |
| Vesipyrin | 284 | 284 |
| Water, ammonia, examination of samples (Thorley) | 416 | 416 |
| purification of drinking | 582 | 582 |
| Waters, aromatic | 282 | 282 |
| the aromatic medicated, preparation of (Earl) | 418 | 418 |
| Wellcome Historical Exhibition | 300 | 300 |
| Wiegand scholarship (Committee) | 152 | 152 |
| Wild cherry, syrup of, U.S.P., 1900 (England) | 267 | 267 |
| discussion | 348 | 348 |
| Women as dispensers | 495 | 495 |
| Zymphene | 140 | 140 |



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CONTENTS.

| | |
|---|--------------|
| Edward Tonkin Dobbeins | Frontispiece |
| Sunday Closing and Shorter Hours. By R. W. Cuthbert, Ph.G. | 503 |
| The Mental Necessity of an Early-closing Movement. By Joseph W. England, Ph.G. | 505 |
| Sunday Rest as a Religious Institution. By Rev. David M. Steele, Rector of the Church of St. Luke and the Epiphany, Philadelphia | 508 |
| The Debasing Influence of Monotony. By John K. Thum, Assistant Apothecary at the German Hospital, Philadelphia | 514 |
| Practical Experience with Sunday Closing. By Dr. C. A. Weidemann; W. L. Cliffe, Ph.G.; Dr. Joseph A. Conwell, Vineland, N. J.; and Theodore Campbell, Ph.G. | 516 |
| Pharmaceutical Meeting: Symposium on Sunday Closing and Shorter Hours | 519 |
| Tincture of Nux Vomica, U.S.P., 1900. By Joseph W. England, Ph.G. | 527 |
| Education and Legislation in Pharmacy. By Prof. Oscar Oldberg, Northwestern University School of Pharmacy | 530 |
| The American Conference of Pharmaceutical Faculties: Synopsis of the Proceedings, September, 1906 | 541 |
| Recommendations to the Boards of Pharmacy | 544 |
| Book Reviews: "A Text-book of Chemistry," by Professors Sadler and Coblenz | 546 |
| Philadelphia College of Pharmacy: Semi-annual meeting; Minutes of the Board of Trustees; Report of Committee on Necrology | 548 |
| Philadelphia Branch of the American Pharmaceutical Association | 551 |

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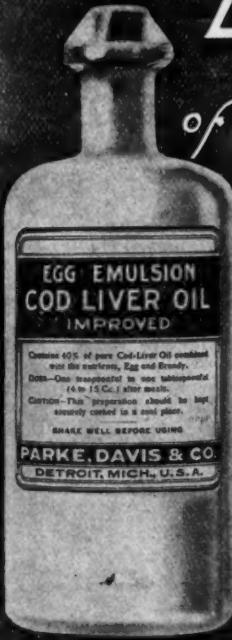
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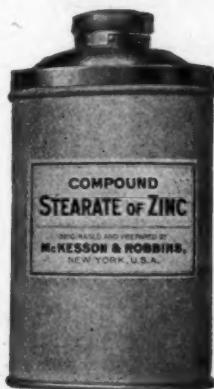
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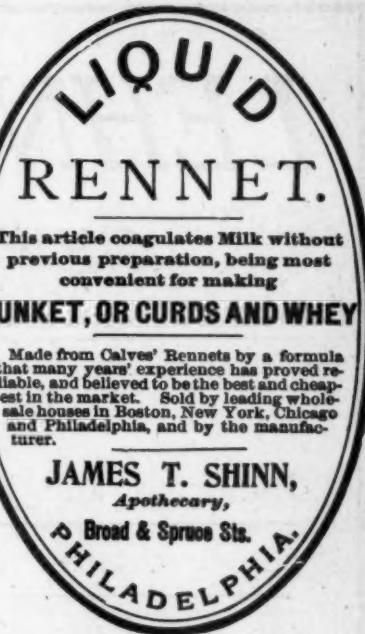
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LITERATURE SUPPLIED ON APPLICATION

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